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of the

UNITED STATES PATENT AND TRADEMARK OFFICE

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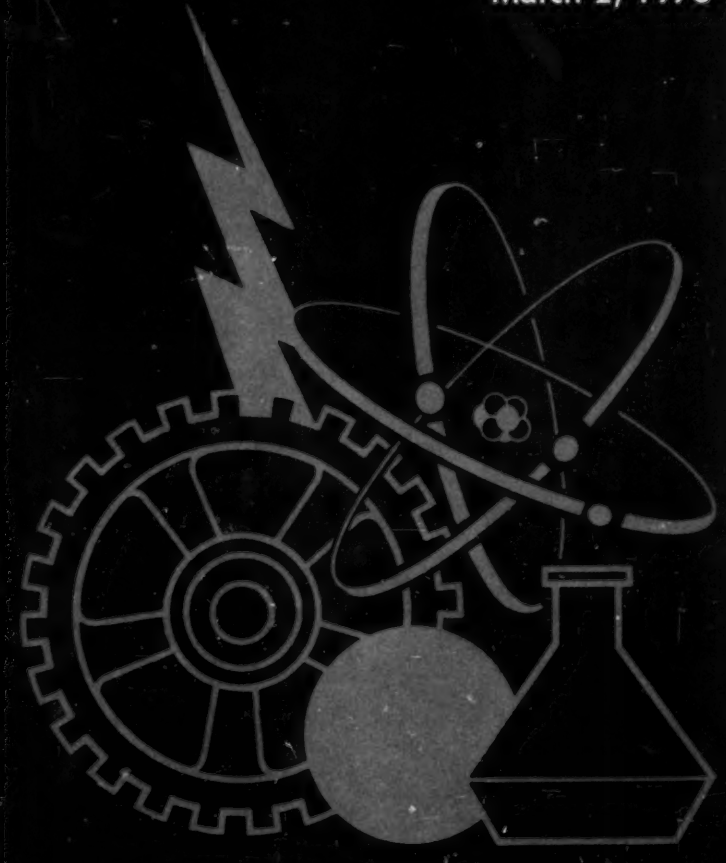

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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

March 2, 1976 Volume 944 Number 1

CONTENTS

	Page
Patent and Trademark Notices	
Board of Appeals Decisions Rendered in the Month of January 1976	2
Second Trial Voluntary Protest Program	2
Patent Suits	3
Patent Notices	
Certificates of Correction for the Week of March 2, 1976	5
Condition of Patent Applications	6
Reissue Patent Applications Published Under Second Trial Voluntary Protest Program	7
Patent Applications Published Under Second Trial Voluntary Protest Program	
General and Mechanical	9
Chemical	18
Electrical	31
Defensive Publications (T944,001)	40
Reissue Patents Granted (28,726)	43
Plant Patents Granted (3,831)	44
Patents Granted	
General and Mechanical (3,940,801)	45
Chemical (3,941,559)	301
Electrical (3,941,913)	398
Design Patents Granted (238,982)	493
Index of Applicants and Assignees of Published Applications	PI 1
Classification of Published Patent Applications	PI 4
Index of Patentees	PI 11
Index of Applicants of Defensive Publications	PI 54
Index of Applicants and Assignees of Reissue Applications	PI 54
Classification of Published Reissue Patent Applications	PI 55
Index of Reissue Patentees	PI 55
Index of Plant Patentees	PI 55
Index of Design Patentees	PI 55
Classification of	
Patents (Including Reissues)	PI 59
Designs, Plants and Defensive Publications	PI 62
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 63
Designs, Plants and Applicants of Defensive Publications	PI 65

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PATENT AND TRADEMARK OFFICE NOTICES

Board of Appeals Decisions Rendered in the Month of January 1976

Examiner affirmed	280
Examiner affirmed in part	46
Examiner reversed	122
Total	448

Second Trial Voluntary Protest Program

A Second Trial Voluntary Protest Program will be conducted during the coming months. It will be increased in scale and somewhat modified in procedure from the first such program. Announcement of and description of the rules for the first program appeared in 923 O.G. 2 on June 4, 1974.

As before, the objective is to gain experience in carrying out such a program and to determine the extent of interest by the public in participating and in supplying pertinent references. To the extent there is participation, the program should be beneficial by bringing new art to the attention of the Office, preventing inadvertent issuance of invalid patents, and increasing confidence in the strength of those patents which survive the protest proceedings.

The first Trial Voluntary Protest Program showed a considerable interest by applicants and the public in taking part in protest proceedings. A summary of the results will be published soon in this Gazette. The second Trial Voluntary Protest Program is designed to gain additional information as to public participation and also to follow more closely the procedures which would be required in a continuing, permanent protest program.

Applications Involved

In the second Trial Voluntary Protest Program, a Request to Participate and Waiver of Confidentiality form (PTOL–224 Temp.) will be sent to each applicant to whom a Notice of Allowance is mailed during a selected three week period, probably in October, 1975. The total number of requests mailed will be about 4,500. Applications for plant patents will be excluded from the program. The reason for this exclusion is the high cost of printing colored drawings and the relatively limited prior art available. No other applications will be excluded from the trial program, regardless of subject matter, type of application or earlier proceedings.

Waiver of Confidentiality

Two copies of the form letter requesting voluntary waiver of confidentiality (form PTOL–224 Temp.) will be mailed in the same envelope along with the Notice of Allowance. An additional copy of the form letter will be made of record in each application at the time of mailing. The applicant will have three months from the notice of allowance date in which to either (1) elect to participate in the Trial Voluntary Protest Program by filing a signed waiver of confidentiality, or (2) elect not to participate in the program by paying the issue fee. If he does neither, the application will become abandoned, as provided in 37 C.F.R. 1.316. The waiver of confidentiality is a part of form PTOL–224 Temp. This procedure will avoid any increase in pendency time for those applications in which an election is made not to participate in the program. An early filing of a waiver of confidentiality by the applicant will result in early publication of the application.

Publication

If the applicant decides not to participate in the protest program and payment of the issue fee is timely made, the patent will issue routinely without delay.

If the applicant elects to participate in the protest program and a signed waiver of confidentiality is filed in the Office within 3 months of the notice of allowance date, the Notice of Allowance will be vacated. In such a case the issue fee should not be filed, as it will not be accepted and applied if filed with a signed waiver of confidentiality. An additional Notice of Allowance will be issued after the protest proceedings have been completed if only allowable claims remain in the application.

After a signed waiver has been filed, the application will be printed in the form of a patent and be available for sale as in the first Trial Voluntary Protest Program. At least one claim and a drawing figure, if any, will be printed in the OFFICIAL GAZETTE. These published applications will appear in about 6 to 9 issues of the OFFICIAL GAZETTE early in 1976. Advance notice will be given in the OFFICIAL GAZETTE of the dates on which applications will be published under this program.

Inspection of Files

The Patent and Trademark Office files of the published applications will be available for inspection by the public for a period of three months after publication. The application files will be retained in a single location in the Patent Issue Division during the protest period. This single location will be staffed with personnel to process papers directed to these files, supervise inspection of the files by the public, provide copies of file contents when ordered, and perform other related duties. A coin operated copying machine will also be available at this location.

Filing of Protests

Protests relating to the patentability of any published application must be filed in writing in the Patent and Trademark Office no later than three months after publication of the application. No extension of the three month protest period will be granted. Each protest must be filed in duplicate (one copy will be forwarded to the applicant and the other copy will be placed in the application file) and must indicate the grounds for protesting the allowance of any claim contained in the published application. If the protest involves prior art not of record in the application, two copies of the alleged prior art, together with an explanation of the relevance of such prior art to the allowed claims, should be included. The protester may also comment on the prior art record in the application and the manner in which it was applied.

In those applications where prima facie evidence of prior public use or sale the claimed invention is presented in accordance with 37 C.F.R. 1.292, public use proceedings will give the protester an opportunity to present evidence.

Should claims be copied from a published application for interference purposes, the applicant copying claims must also file a notice of such copying in the file of the published application to avoid the possibility of inadvertent issuance of the published application as a patent before conclusion of any interference proceedings.

For easy identification, all protests should be headed, "Protest Under Trial Voluntary Protest Program" and be addressed to:

Commissioner of Patents and Trademarks
Box TVPP
Washington, D.C. 20231

The protester should fully identify himself and include his mailing address so that communications may be addressed to him. In view of administrative problems encountered in the first Trial Voluntary Protest Program in protecting the confidentiality of the identity of protesters, no attempt will be made by the Office to maintain the confidentiality of any protester under the new program.

If no protests are received during the protest period, the application file will be rerouted for the mailing of a new Notice of Allowance. The file will not be returned to the examining group except for consideration of matters which normally require return of an allowed file.

If one or more protests are filed in an application, the application file and the protest(s) will be returned to the examining group for consideration.

Consideration of Protest

The examining group will acknowledge receipt of all protests. The authority for deciding whether or not the evidence submitted constitutes a prima facie showing of unpatentability of any allowed claim will reside with the Group Director. If the Group Director decides that no such showing has been made, the application will be forwarded to the Patent Issue Division for mailing of a new Notice of Allowance. Protesters will be notified in such cases that prosecu-

tion has not been reopened, and the applicant will be sent a duplicate copy of all protests. The decision of the Group Director will be final and will not be subject to petition by a protester.

If the Group Director decides that the submitted evidence constitutes a prima facie showing of unpatentability of any allowed claim, prosecution of the application will be reopened. The decision to reopen prosecution will be communicated to the applicant by means of an Office action, signed by a primary examiner, rejecting any claim considered unpatentable. The duplicate copy of each protest will be mailed to the applicant with the Office action. Protesters who submitted evidence on which the rejection is based will be identified in the Office action and will also receive copies of this and subsequent Office actions. Other protesters will be notified that prosecution has been reopened, but based on evidence and for reasons other than those submitted by them and that, consequently, no further correspondence will be directed to them. The applicant will normally be given a three month shortened statutory period to respond to the Office action.

Response by the Applicant to Subsequent Office Actions

During this period, the applicant may present amended or new claims which will be subject to further consideration by the primary examiner. In order to allow protesters who submitted evidence on which a rejection in the Office action is based to participate in later prosecution and to comment upon further proceedings, applicant will be required to serve by mail upon each protester identified in the Office action, a copy of any response filed, including any appeal brief. Indication of such service will be a required component of a complete response. Applicant need only reply to the rejections and objections made in the Office action. There need be no specific response to any other points raised by the protesters.

Comment on Applicant's Response by the Protester

Each protester served will be allowed one month, running from the date applicant's response or brief is received in the Patent and Trademark Office, to file comments relating thereto. All communications from protesters must be in writing. Examiner interviews with the protesters will not be permitted. No extensions of the one month period will be granted.

Any appeal by the applicant to the Board of Appeals in a protested application will be made special and will be taken up out of order.

Conclusion of Prosecution

If, after further prosecution, the application is found to be allowable, all protesters still participating at that time will be notified and the application will be forwarded to the Patent Issue Division for mailing of a new Notice of Allowance. A decision of the primary examiner to allow an application will not be subject to petition or appeal by any protester.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Sept. 16, 1975.

[938 O.G. 945]

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

3,286,923, Jackson and Braucksiek, THERMOSTATIC CONTROL DEVICE FOR NORMAL AND ABNORMAL CONDITIONS, **filed** Oct. 31, 1975, D.C., W.D. Mich. (Grand Rapids), Doc. G75 527 Cal, *Robertshaw Controls Co.* v. *Bradford-White Corp.*

3,302,345, J. S. Ballantine, TOWER, **filed** Nov. 3, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c3717, *Centsable Products, Inc.* v. *Jerome H. Lemelson.*

3,390,893, O. F. Maclaren, STRUCTURES FOR FOLDING BABY-CARRIAGES, CHAIRS, AND THE LIKE, **filed** Oct. 29, 1975, D.C., S.D.N.Y., Doc. 75–C–5379, *Owen Finlay Maclaren, Miron Charles Bell and Gerico Incorporated* v. *Storlee of California, Inc.* **Same, filed** Oct. 29, 1975, D.C., S.D.N.Y., Doc. 75–C–5380 IBW, *Owen Finlay Maclaren* v. *Hedstrom Company.* **Same, filed** Oct. 29, 1975, D.C., S.D.N.Y., Doc. 75–C–5382RJW, *Owen Finlay Maclaren* v. *Peterson Baby Products.* **Same, filed** Oct. 29, 1975, D.C., S.D.N.Y., Doc. 75–C–5383, *Maclaren, Owen Finlay, Miron Charles Bell and Gerico Incorporated* v. *Welsh Company.* **Same, filed** Oct. 29, 1975, D.C., S.D.N.Y., Doc. 75–C–5384, *Owen Finlay Maclaren* v. *Bilt Rite Juvenile Products, Inc.*

3,400,038, C. D. Burgess, SEAMING TAPE; **3,415,703,** same, PROCESS FOR FACE-SEAMING CARPETING; **3,485,704,** M. L. Clymin, THERMO-ADHESIVE CARPET-SEAMING TAPE; **3,533,876,** C. D. Burgess, PROCESS FOR FACE SEAMING CARPETING; **3,563,830,** same, PROCESS FOR PREPARING SEAMING TAPE, **filed** Sept. 29, 1975, D.C., N.D. Tex. (Dallas), Doc. CA3–75–1192–D, *L. D. Brinkman & Co.* v. *Unifi Manufacturers & Distributors.* **Same, filed** Oct. 10, 1975, D.C., C.D. Calif. (Los Angeles), Doc. CV75–3430–MML, *Bruck Industries, Inc.* v. *L. D. Brinkman & Co., Inc.*

3,400,038, C. D. Burgess, SEAMING TAPE; **3,415,703,** C. D. Burgess, PROCESS FOR FACE-SEAMING CARPETING; **3,485,704,** M. L. Lymin, THERMO-ADHESIVE CARPET-SEAMING TAPE; **3,533,876,** same, PROCESS FOR FACE SEAMING CARPETING, **filed** Sept. 29, 1975, D.C., N.D. Tex. (Fort Worth), Doc. 4–75–265, *L. D. Brinkman & Co., Inc.* v. *William D. Burham, doing business as R & R Instillation Supply.*

3,405,703. (See 3,400,038.)

3,448,178, T. P. Flanagan, HOT MELT ADHESIVES COMPRISING ETHYLENE/VINYL ACETATE COPOLYMERS AND ALPHA-PINENE/PHENOL CONDENSATION PRODUCTS, **filed** Sept. 21, 1971, D.C., E.D. Wis. (Milwaukee), Doc. 71–C–480, *National Starch and Chemical Corporation* v. *Findlay Adhesives, Inc.* Stipulation and order discontinuing action, Feb. 14, 1974.

3,485,704. (See 3,400,038.)

3,489,462, W. W. Oakey, BRISTLE FEED MECHANISM FOR TWISTED BRISTLE ARTIFICIAL TREE BRANCH MAKING MACHINE, **filed** Nov. 5, 1975, D.C., S.D.N.Y., Doc. 75–C–5543LWP, *Star Band Company, Inc.* v. *General Foam Plastics, Inc.*

3,533,876. (See 3,400,038.)

3,535,734, H. M. Ross, FLUID-OPERATED, FORCE-LIMITED APPARATUS FOR TENDERIZING MEAT, **filed** Oct. 10, 1975, D.C. Del. (Wilmington), Doc. 75–358, *Ross Industries, Inc.* v. *Hollymatic Corporation.*

3,536,141, R. W. Woelfel, OVER CENTER TOGGLE MOUNTING OF PLOW; **3,561,541,** same, TRACTOR AND IMPLEMENT HYDRAULIC CONTROL SYSTEM, **filed** Aug. 10, 1973, D.C., E.D. Wis. (Milwaukee), Doc. 73–C–480, *Roger W. Woelfel* v. *Allis-Chalmers Mfg. Co.* Stipulation and order dismissing action with prejudice, Mar. 14, 1975.

3,561,541. (See 3,536,141.)

3,563,830. (See 3,400,038.)

3,564,495, Gould and Gould, PEDESTRIAN TRAFFIC CONTROL SIGNAL UNIT, **filed** July 19, 1974, D.C., N.D. Ohio (Cleveland), Doc. C–74–644, *Indicator Controls Corporation* v. *Winko-Matic Signal Co.* Stipulation and order dismissing action without prejudice, complaint, supplemental complaint and counterclaims filed. Notice waived, Oct. 7, 1975.

3,604,527, W. H. Price, TRACTOR SUBASSEMBLY, **filed** Feb. 23, 1973, D.C., E.D. Wis. (Milwaukee), Doc. 73–C–86, *Gilson Bros. Co.* v. *Jacobsen Manufacturing Company.* Order granting plaintiff's motion to dismiss, Feb. 25, 1974.

3,644,681, D. E. Rice, CORDLESS TELEPHONE SYSTEM, **filed** Nov. 11, 1974, D.C., E.D. Wis. (Milwaukee), Doc. 74–516, *Bison Enterprises, Ltd.* v. *Fonetron, Inc.* Order dismissing action without prejudice, Oct. 16, 1975.

3,645,732, V. V. Jones, ETCHING ALCOHOL-SOLUBLE NYLON WITH AQUEOUS SOLUTION, **filed** Oct. 20, 1975, D.C., C.D. Calif. (Los Angeles), Doc. CV–75–3544–R, *Keufel & Esser Company* v. *Times-Mirror Press, Inc. and Kimoto USA Inc.*

3,666,516, R. E. Dunning, HOT STAMP TAPE, **filed** Oct. 24, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c3595, *Avery Products Corporation* v. *Kurz-Hastings, Inc.*

3,669,499, Semplonius and Kolk, CHAIR, **filed** Oct. 31, 1975, D.C. Del. (Wilmington), Doc. 75–359, *Steelcase, Inc.* v. *Harvard Industries, Inc.*

3,702,701, Vaughn and Hargravf, METAL TENNIS RACKET WITH PLASTIC THROAT PIECE AND MOLDED PLASTIC HANDLE, **filed** Mar. 12, 1974, D.C.N.J. (Trenton), Doc. C–74–351, *Maark Corporation* v. *Herman's World of Sporting Goods.* Order of dismissal filed and entered, Oct. 31, 1975. **Same, filed** July 2, 1974, D.C.N.J. (Trenton), Doc. C–74–1008, *Maark Corporation* v. *J. C. Penney's.* Order of dismissal filed and entered. Action settled, Oct. 31, 1975.

3,727,886, H. A. Jespersen and E. H. Kidd, FLEXIBLE REAR SHIELD FOR ROTARY LAWN MOWER, **filed** Nov. 4, 1975, D.C. Minn. (Minneapolis), Doc. 4-75-C-561, *The Toro Company* v. *Outboard Marine Corporation.*

3,839,823, Roberts, Peters, Harrington, Broomfield and Crews, METHOD OF CHEMICALLY INDUCING LIGHTWOOD FORMATION IN PINE TREES, **filed** Oct. 31, 1975, D.C., M.D. Fla. (Jacksonville), Doc. 75-759-C-J-S, *SCM Corporation* v. *Earl L. Butz and Hercules, Inc. et al.*

3,855,208, Rutner, Rapun and Lewin, DERIVATIVES OF DIGOXIGENIN, **filed** Oct. 29, 1975, D.C. Mass. (Boston), Doc. C.A. 75-4481, C, *Beaton, Dickinson and Co., Inc.* v. *Clinical Assays, Inc.*

3,864,660, Ranalli and Torrence, ULTRASCOPE; **3,864,661,** R. Ranalli, same, **filed** Oct. 22, 1975, D.C., N.D. Calif. (San Francisco), Doc. C-75-229 ACW, *Rohe Scientific Corporation* v. *Unirad Corporation.*

3,864,661. (See 3,864,660.)

Re. 27,866, E. R. Dunn, PROCESS OF MAKING SOLID FOAMS FROM POLYMER EMULSIONS, **filed** Oct. 29, 1975, D.C. Ga. (Rome), Doc. C75-143R, *Ludlow Corporation* v. *Textile Rubber & Chemical Company, Inc.*

2,900,150, Hirt and Martino, EJECTION SEAT CATAPULT; **3,115,320,** G. E. Hirt, same, **filed** Mar. 9, 1973, D.C. Del. (Wilmington), Doc. 4604, *Talley Industries, Inc.* v. *United States of America.* Stipulation, this action shall be dismissed with prejudice in view of the stipulated entry of judgment in the Court of Claims, Dec. 8, 1975.

3,039,670, F. T. Hardon, COLLAPSIBLE CONTAINER, **filed** Dec. 9, 1975, D.C., S.D.N.Y., Doc. 75-C-6178 RO, *Packaging Corporation of America* v. *Lionel Industries Company, Inc.*

3,115,320. (See 2,900,150.)

3,218,588, J. G. Badger, TELEVISION TUNER; **3,842,683,** A. A. Valdettaro, UHF TUNER ARRANGEMENT, **filed** Sept. 26, 1975, D.C., E.D. Va. (Norfolk), Doc. C/A 75-504-N, *Sarkes Tarzian, Inc.* v. *Mitsumi Electric Co., Ltd. and General Electric Company.*

3,236,931, A. B. Freeman, ELECTRONIC MUSICAL INSTRUMENT, **filed** Dec. 5, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c4140, *Norlin Music, Inc.* v. *The Wurlitzer Company.*

3,294,465, P. E. Pritchard, PHONOGRAPH PICKUP, **filed** Dec. 4, 1975, D.C. Conn. (Bridgeport), Doc. B-75-386, *Audio Dynamics Corp.* v. *Sonic Research Inc. and Peter E. Pritchard.*

3,492,769, R. B. Olson, ANTENNA MOUNT, **filed** Dec. 3, 1975, D.C., S.D.N.Y., Doc. 75-C-6044, *Hy Gain Electronics Corp.* v. *Conrac Corporation.*

3,541,631, Kluge and Paulson, INDUSTRIAL VACUUM LOADER AND CLEANER, **filed** Apr. 12, 1973, D.C., E.D. Wis. (Milwaukee), Doc. 73-C-200, *Super Products Corporation* v. *DP Way Corporation et al.* Judgment, claim of said patent, dated November 24, 1970 is declared invalid, Dec. 11, 1975.

3,547,108, S. V. Seiffert, COMBINATION DEFIBRILLATOR AND HEARTBEAT MONITORING SYSTEM, **filed** Jan. 24, 1974, D.C., N.D. Ill. (Chicago), Doc. 74c213, *Physio-Control Corporation* v. *Travenol Laboratories, Inc.* Ordered that all the counterclaims asserted by Travenol Labs. Inc. against Physio-Control Corp. are hereby dismissed with prejudice. Further ordered that all claims for attorney fees asserted by the parties are hereby dismissed with prejudice and further order the above captioned case is hereby dismissed with prejudice, Sept. 19, 1975.

3,613,430, S. R. Crees, WIRE BENDING APPARATUS; **3,888,101,** same, CABLE BENDER, **filed** Dec. 12, 1975, D.C., M.D. Fla. (Orlando), Doc. 75-415-Orl-C-R, *Manufacturing Research Corportaion* v. *Greenlee Tool Company.*

3,646,696, R. Sarkisian, POSTER DISPLAY DEVICE; **3,662,482,** same, **filed** Dec. 10, 1975, D.C. Oreg. (Portland), Doc. 75-1131, *Robert Sarkisian* v. *Winn-Proof Corporation, William A. Werner and Sunset Manufacturing Co.*

3,662,482. (See 3,646,696.)

3,669,499, Semplonius and Kolk, CHAIR, **filed** Dec. 12, 1975, D.C., E.D. Mo. (St. Louis), Doc. 75-1130C(2), *Harvard Industries, Inc.* v. *Stellcase Inc.*

3,842,683. (See 3,218,588.)

3,888,101. (See 3,613,430.)

D. 227,352, Meng and Driessen, PACKAGE WITH STAGGERED PRODUCT SLICES, **filed** Oct. 16, 1975, D.C., W.D. Wis. (Madison), Doc. 75-C-480, *L. D. Schreiber Cheese Co., Inc.* v. *Land-O-Lakes.*

D. 229,551, W. H. Horgan, Jr., DOOR, **filed** Jan. 13, 1975, D.C., S.D. Calif. (San Diego), Doc. 75-0022-S, *Guildmark Homes of California, doing business as Ironside* v. *Foster Industries, D. W. Oswood et al.* Judgment in favor of plaintiff, Sept. 15, 1975.

PATENT NOTICES

Certificates of Correction for the Week of Mar. 2, 1976

Re. 28,599	3,886,215	3,911,917	3,920,051
Re. 28,609	3,886,951	3,911,946	3,920,075
D. 234,914	3,887,879	3,912,226	3,920,263
D. 237,004	3,888,147	3,912,393	3,920,433
3,547,812	3,889,483	3,912,614	3,920,677
3,576,810	3,889,551	3,912,700	3,920,735
3,576,923	3,890,171	3,912,871	3,920,803
3,597,207	3,890,248	3,913,214	3,920,822
3,607,258	3,890,370	3,913,291	3,920,944
3,629,395	3,891,956	3,913,327	3,920,976
3,641,200	3,892,713	3,913,498	3,920,980
3,660,381	3,892,745	3,913,699	3,921,001
3,663,589	3,894,078	3,913,768	3,921,010
3,669,910	3,896,094	3,914,254	3,921,039
3,692,744	3,896,710	3,914,586	3,921,380
3,707,667	3,897,212	3,914,829	3,921,595
3,718,923	3,897,523	3,914,870	3,921,605
3,725,459	3,898,185	3,915,032	3,921,615
3,725,509	3,898,561	3,915,062	3,921,641
3,731,180	3,898,987	3,915,354	3,921,847
3,736,022	3,899,309	3,915,365	3,921,970
3,771,548	3,899,847	3,915,839	3,929,139
3,777,239	3,899,655	3,915,884	3,92_,229
3,786,396	3,900,002	3,915,890	3,922,314
3,805,014	3,900,221	3,915,923	3,922,411
3,809,831	3,900,248	3,916,089	3,922,672
3,814,968	3,900,471	3,916,116	3,922,780
3,818,484	3,901,911	3,916,118	3,922,781
3,820,671	3,902,067	3,916,171	3,922,832
3,824,776	3,902,182	3,916,463	3,922,865
3,829,855	3,903,097	3,916,475	3,922,955
3,834,154	3,903,846	3,916,664	3,922,999
3,835,077	3,903,912	3,916,726	3,923,006
3,838,173	3,904,117	3,916,805	3,923,354
3,840,068	3,904,446	3,916,850	3,923,430
3,842,299	3,904,609	3,916,988	3,923,505
3,842,929	3,904,683	3,917,032	3,923,588
3,843,662	3,904,691	3,917,105	3,923,775
3,843,896	3,904,832	3,917,252	3,923,882
3,844,499	3,905,621	3,917,397	3,923,883
3,847,856	3,905,840	3,917,409	3,924,198
3,851,192	3,905,949	3,917,642	3,924,216
3,851,654	3,905,967	3,917,779	3,924,244
3,855,444	3,906,543	3,917,866	3,924,323
3,858,976	3,906,965	3,918,066	3,924,410
3,863,225	3,907,600	3,918,069	3,924,429
3,863,595	3,907,831	3,918,081	3,924,445
3,864,038	3,907,866	3,918,115	3,924,456
3,868,436	3,907,933	3,918,165	3,924,521
3,869,719	3,908,641	3,918,221	3,924,647
3,870,750	3,908,643	3,918,249	3,924,833
3,872,182	3,908,852	3,918,276	3,925,127
3,873,638	3,909,602	3,918,298	3,925,348
3,875,489	3,909,682	3,918,419	3,925,708
3,876,296	3,909,938	3,919,050	3,926,310
3,876,929	3,910,131	3,919,126	3,926,390
3,878,931	3,910,990	3,919,256	3,926,401
3,879,749	3,911,078	3,919,278	3,926,492
3,880,514	3,911,084	3,919,335	3,928,072
3,882,386	3,911,240	3,919,375	3,928,534
3,882,769	3,911,297	3,919,527	3,928,686
3,883,227	3,911,538	3,919,548	3,929,068
3,883,867	3,911,567	3,919,624	3,929,106
3,884,198	3,911,659	3,919,791	
3,885,305	3,911,705	3,919,993	

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JANUARY 31, 1976

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	3-19-75
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	1-9-75
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	1-13-75
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	3-5-75
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	2-5-75
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	12-23-74
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	3-17-75
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	5-1-75
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	8-1-75
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	5-1-75
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	9-23-74
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	3-14-75
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	4-15-75
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	6-2-75
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	3-28-75
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	7-7-75

Expiration of patents: The patents within the range of numbers indicated below expire during February 1976, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,871,479 to 2,875,444 inclusive
Plant Patents..... Numbers 1,805 to 1,813 inclusive

REISSUE APPLICATIONS

PUBLISHED MARCH 2, 1976
UNDER THE SECOND TRIAL VOLUNTARY PROTEST PROGRAM

NOTE- A copy of the notice setting forth the details of the Second Trial Voluntary Protest Program may be found in the Patent and Trademark Notices section of this issue.

Any protests relating to the patentability of these published reissue applications must be filed in writing before June 2, 1976. These applications are available for inspection in the Allowed Files Branch, Crystal Plaza, Room 2-10C28. All correspondence should be addressed to:

Commissioner of Patents and Trademarks
Box TVPP
Washington, D.C. 20231

Printed copies of the published reissue applications may be purchased from the Patent and Trademark Office at 50 cents each.

An "Index of Applicants and Assignees of Reissue Applications" and a concordance entitled "Classification of Published Reissue Patent Applications" are located in the back of this issue.

REISSUE APPLICATIONS

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

B 551,952
METHOD OF MANUFACTURE OF DOWN INSULATED GOODS

James W. Kack, and Terry W. Mowbray, both of Boulder, Colo., assignors to Holubar Mountaineering, Ltd., Boulder, Colo.

Original No. 3,771,203, dated Nov. 13, 1973, Ser. No. 236,080, Mar. 20, 1972. Application for reissue Feb. 21, 1975, Ser. No. 551,952

Int. Cl.[2] D06M *17/00*

U.S. Cl. 28—77 **29 Claims**

References Cited

FOREIGN PATENTS OR APPLICATIONS

797,704	2/1936	France	5/355
800,989	12/1950	Germany	5/355

SUPERIMPOSE 2 LAYERS OF CLOTH
SEW POCKETS WITH ONE OPEN END
PLACE ONE PACKET OF DOWN IN EACH POCKET
SEW OPEN ENDS OF POCKETS CLOSED
BREAK PACKET BY PRESSURE
WASH IN SOLVENT FOR PACKET COVER
WASH IN SOLVENT FOR PACKET COVER

21. A Method of placing insulating down in a compartment in a garment comprising: Inserting in a down compartment in such a garment a down-containing packet made of a soluble film sealed against escape of down from said packet; securing said compartment closed and into a down-holding compartment; and immersing said compartment in a solvent for said soluble film to release down therein.

B 451,438
BIODEGRADABLE RADIOACTIVE PARTICLES

Roger L. Evans, Sunfish Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Original No. 3,663,685, dated May 16, 1972, Ser. No. 717,965, Apr. 1, 1968. Application for reissue Mar. 15, 1974, Ser. No. 451,438

Int. Cl.[2] A61K *43/00, 9/14*

U.S. Cl. 424—1 **16 Claims**

References Cited

UNITED STATES PATENTS

3,061,510	10/1962	Numerof et al.	424/1
3,121,041	2/1964	Stern et al.	424/1
3,127,313	3/1964	Glenn	424/1
3,137,631	6/1964	Soloway	264/4
3,202,731	8/1965	Grevenstuk et al.	252/316
3,329,817	7/1967	Walz	252/301.1
3,334,050	8/1967	Grotenhuis et al.	424/1
3,351,049	11/1967	Lawrence	252/301.1
3,499,962	3/1970	Wurzburg et al.	424/35
3,674,900	7/1972	Thompson	424/1

1. Tiny free-flowing, unagglomerated radioactive particles of the order of about one-half micron to 1 millimeter in largest dimension, consisting essentially of a gelled vehicle of physiologically acceptable parenterally metabolize sol-forming polysaccharide of the class consisting of glycogen, starch and dextran or protein of the class consisting of albumin, gelatin and hemoglobin having dispersed therein a physiologically acceptable inorganic carrier for radionuclides, said carrier having solubility product less than about 1×10^{-4}, said carrier containing a radionuclide and being present in said particles in amount ranging from that which is at least adequate to contain said radionuclide up to about 50% by weight based upon the weight of the vehicle, and said particle being resistant to leaching of said [radioisotope] *radionuclide* when immersed in water at 37° C. for at least about 15 minutes.

B 587,118

COMPACT FLATBED PAGE SCANNER

Hugh Alexander Watson, Berkeley Heights, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Original No. 3,867,569, dated Feb. 18, 1975, Ser. No. 445,051, Feb. 25, 1974. Application for reissue June 13, 1975, Ser. No. 587,118

Int. Cl.² H04N 1/10

U.S. Cl. 178—7.1 **4 Claims**

References Cited

UNITED STATES PATENTS

3,752,558	8/1973	Lloyd	178/7.6
3,830,972	8/1974	McHugh	178/7.1

3. A compact flatbed scanner for facsimile scanning comprising:

(a) a housing;

(b) a transparent plate mounted on the housing for supporting material to be copied, the transparent plate defining the approximate image plane of the material to be copied;

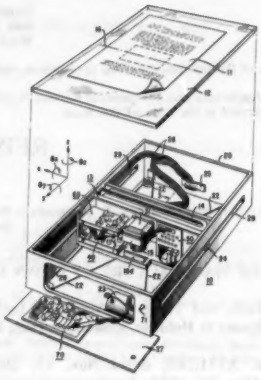
(c) a moving scanning assembly supported within the housing beneath the transparent plate, the scanning assembly comprising:

(1) means for mounting at least one lamp for illuminating at least a portion of the image plane,

(2) a linear solid state imaging device for detecting variations in intensity of light reflected from a scanning line on the image plane and having electrical contacts adapted to provide electronic scanning over the length of the scanning line, and

(3) an optical system for focusing the light reflected from the scanning line onto the linear imaging device, the optical system comprising a plurality of long narrow mirrors for folding the optical path from the scanning line to the linear imaging device;

(d) means for mechanically displacing the scanning assembly relative to the image plane in a direction parallel to the image plane and perpendicular to the scanning line to permit scanning a succession of parallel lines from one end of the image plane to the other; and



(e) electrical circuitry for sequentially reading out each scanning line detected by the linear imaging device by forming an electrical signal representative of the variations in intensity of light reflected from the image plane along a succession of scanning lines.

PATENT APPLICATIONS

PUBLISHED MARCH 2, 1976
UNDER THE SECOND TRIAL VOLUNTARY PROTEST PROGRAM

NOTE- A copy of the notice setting forth the details of the Second Trial Voluntary Protest Program may be found in the Patent and Trademark Notices section of this issue.

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Commissioner of Patents and Trademarks
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Washington, D.C. 20231

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An "Index of Applicants and Assignees of Published Applications" and a concordance entitled "Classification of Published Patent Applications" are located in the back of this issue.

GENERAL AND MECHANICAL APPLICATIONS

B 371,912
SHIPPING BIN FOR SHEETS WITH DEVICE FOR RESTRAINING MOVEMENT OF THE SHEETS

James R. Rowley, Freeport, and Walter E. Pater, Lower Burrell, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

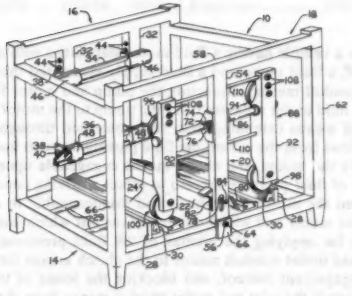
Filed June 20, 1973, Ser. No. 371,912
Int. Cl.[2] B65D *85/48*
U.S. Cl. 206—451 **17 Claims**

References Cited
UNITED STATES PATENTS

2,156,876	5/1939	Scull	206/454 X
2,885,221	5/1959	Weeks	280/179
3,061,085	10/1962	Hoskins et al.	206/451
3,346,221	10/1967	Farmer	206/523 X
3,596,755	8/1971	Bundy et al.	206/451
3,809,234	5/1974	Kurick	206/448

FOREIGN PATENTS OR APPLICATIONS

68,857	9/1969	Germany	206/454



1. In combination with a bin for shipping a plurality of sheets wherein the bin is of the type having a base and a substantially vertical backwall for supporting the sheets in a generally vertical position on an edge, a front restraint device comprising:

at least one rigid member having a first end and a second end opposite to the first end; and

means held in position in a plane substantially parallel with the backwall and pivotally mounting said at least one rigid member between the first and second end thereof in spaced relation to the backwall to pivot said at least one rigid member about an axis generally parallel to the backwall and to the base of the bin.

B 396,916
HORIZONTAL ROLL-RACK FOR CONTINUOUS CASTING

Charles H. Bode, Jr., Bethel Park Borough, and Francis Gallucci, North Huntingdon Township, Westmoreland County, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

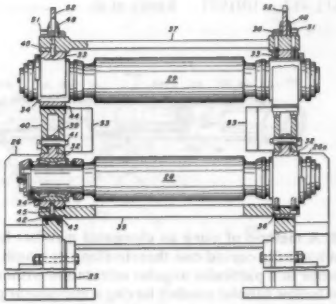
Filed Sept. 13, 1973, Ser. No. 396,916
Int. Cl.[2] B22D *11/14*; B21B *31/12*
U.S. Cl. 164—282 **3 Claims**

References Cited
UNITED STATES PATENTS

3,349,835	10/1967	Muller	164/260
3,608,620	9/1971	Bollig	164/274
3,623,348	11/1971	Thompson	72/238 X
3,707,180	12/1972	Vogt	164/82
3,733,877	5/1973	Field	72/239
3,735,804	5/1973	Wagner	164/282
3,753,461	8/1973	Gallucci	164/282
3,763,923	10/1973	Gallucci	164/282
3,766,962	10/1973	Rossi	164/282 X
3,794,107	2/1974	Bollig	164/282

FOREIGN PATENTS OR APPLICATIONS

1,965,115	12/1969	Germany	164/282
256,749	7/1963	Australia	164/282



1. In a low-head continuous-casting machine which includes in succession:

a mold for forming a casting of indefinite length and intially having a solidified outer skin and a liquid core;

means below said mold for confining and guiding the casting and changing its direction of travel from essentially vertical to horizontal while the core continues to solidify;

a straightener; and

a horizontal roll-rack for confining and guiding the casting as it travels horizontally;

said machine also including secondary cooling means extending from below said mold at least through said confining and guiding means for solidifying the casting throughout at a plane located within said horizontal roll-rack;

said horizontal roll-rack including at least one idler roll section and a driven roll stand at the exit end of said idler roll section;

the improvement in which said idler roll section includes:

a pair of spaced-apart upstanding roll housings having a plurality of windows;

pairs of opposed bottom roll chocks and opposed top roll chocks removably received in the windows of said housings;

respective bottom and top idler rolls journaled in said bottom and top chocks; and

means removably connecting the respective top chocks to the bottom chocks to enable each bottom and top chocks and the rolls journaled therein to be lifted from said housings as units;

said top rolls and their chocks being removable from said housings on removal of said connecting means independently of the corresponding bottom rolls and their chocks to enable a segment of the idler roll section beyond the plane where the casting solidifies throughout to operate as a simple runout conveyor for the casting.

B 415,021

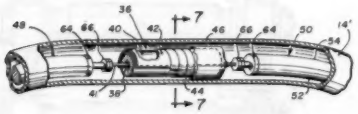
REMOTE ORIENTATION OF A PROBE IN A TUBULAR CONDUIT

Charles Theodore Ward; Donald Lee Mathis, and Frank Taylor Radcliff, all of Chattanooga, Tenn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Nov. 12, 1973, Ser. No. 415,021
Int. Cl. G01n *23/00*
U.S. Cl. 73—432 R **13 Claims**

References Cited
UNITED STATES PATENTS

1,501,354	7/1924	Marks	254/134.3 FT X
1,978,704	10/1934	Elmer	73/343 R
2,622,209	12/1952	Hjulian et al.	214/1 CM X
2,976,423	3/1961	Prest	250/497
3,032,661	5/1962	Wolf	250/497
3,612,487	10/1971	Raney et al.	73/432 R X



8. A method of using an elongated member having a resilient naturally curved cast thereto along its length for orienting a probe in a particular angular orientation within and relative to a hollow tubular conduit having a curvilinear portion along its length, said particular angular orientation having a predetermined angular relationship to the plane of curvature of the curvilinear portion of the conduit, comprising the steps of:

attaching an end of said probe to said member against rotation relative thereto and at the same angular relationship to the plane of curvature of said naturally curved cast thereof as to the plane of curvature of said curvilinear portion of the conduit; and

propelling said member and probe through said conduit to a preselected longitudinal position, said direction of propulsion being such that at least part of the length of said member transits said curvilinear portion of said conduit prior to said probe arriving at said preselected position.

B 432,969

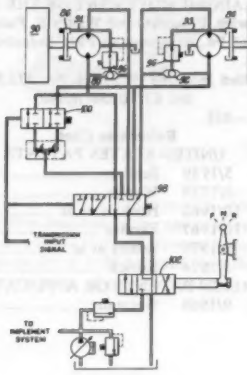
AUXILIARY HYDROSTATIC FRONT WHEEL DRIVE SYSTEM

John A. Campbell, Decatur; Joseph E. Dezelan, Joliet, both of Ill., and Cullen P. Hart, Chofu, Japan, assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 14, 1974, Ser. No. 432,969
Int. Cl.² B60K *25/00*
U.S. Cl. 180—44 F **8 Claims**

References Cited
UNITED STATES PATENTS

2,397,299	3/1946	Strid	60/402
3,481,419	12/1969	Kress et al.	180/53 R
3,579,988	5/1971	Firth et al.	180/44 F
3,833,100	9/1974	Aschauer	192/85
3,851,741	12/1974	Sugahara et al.	192/85 R



1. In a vehicle having a fluid motor associated with a wheel thereof, a fluid pump and a fluid supply associated therewith, inlet conduit means connecting the pump and motor for supplying fluid under pressure from the pump to the motor, outlet conduit means extending from the motor and through which fluid flows from the motor, the fluid passing through the motor to drive the motor, and clutch means engageable upon application of fluid pressure thereto to effect a driving connection between the motor and wheel, and disengageable to disconnect the motor and wheel, the improvement which comprises means for applying the greater of the fluid pressures in the inlet and outlet conduit means to the clutch means for inducing engagement thereof, and blocking the lesser of the fluid pressures in the inlet and outlet conduit means from the clutch means.

8. In a vehicle having a pair of wheels, a pair of fluid motors associated therewith, means for transmitting power from the motors to drive the wheels, a fluid pump and a fluid supply associated therewith, and fluid circuit means operatively connecting the pump and the motors, the improvement comprising control means operatively associated with the fluid circuit means comprising a first control valve shiftable into a first position, wherein the motors are connected with the pump to be driven in series thereby, and into a second position, said control means further comprising a second control valve shiftable to an actuated position wherein, with the first control valve in its second position, the motors are connected with the pump to be driven in parallel thereby, the second control valve being shiftable to a deactuated position, said parallel drive being provided only with the first control valve in its

second position and the second control valve in its actuated position and further comprising means for shifting the first control valve to its second position and for shifting the second control valve to its actuated position, comprising fluid pressure operatively associated with the first and second control valves to so shift said control valves to their second and actuated positions respectively upon a certain level of fluid pressure being achieved, the level of said fluid pressure being determined by the speed of the vehicle.

B 432,991

CALENDER PRESSES

David Charles Cumbers, Pontypool, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Jan. 14, 1974, Ser. No. 432,991

Claims priority, application United Kingdom, Jan. 17, 1973, 2394/73

Int. Cl.² B30B *3/04*

U.S. Cl. 100—162 B **28 Claims**

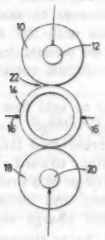
References Cited

UNITED STATES PATENTS

864,660	8/1907	Love	100/160
1,803,926	5/1931	Vedder	100/160
2,191,144	2/1940	Hornbostel	100/176 X
2,800,012	7/1957	Goetz et al.	100/160 X
2,850,952	9/1958	Hornbostel	100/163 R
2,970,339	2/1961	Hausman	100/162 B
3,266,414	8/1966	Wahlstrom et al.	100/163 R
3,389,448	6/1968	Buysch	29/110
3,451,331	6/1969	Frederickson et al.	100/162 R
3,572,570	3/1971	Mortensen et al.	100/170

FOREIGN PATENTS OR APPLICATIONS

788,450	1/1958	United Kingdom	100/155 R



1. A calender press or the like comprising two hard-surfaced cooperating rolls having substantially parallel axes and arranged to define a nip therebetween, at least one of said rolls being a hollow cylinder provided with means locating it with respect to the other roll and with means engaging and supporting it at least substantially along the length of the nip and urging it toward the other roll to generate a desired nip pressure in the nip, the diameter and wall thickness of said hollow cylinder being such that said hollow cylinder is elastically deformable by bending or by squashing or both and thereby accomodates distortions in said other roll or variations in thickness of sheet material passing through the nip to reduce variations in nip pressure along the length of the nip, the radius, R, and the wall thickness, *t*, of the hollow cylinder having the limits

$$Rt^{-2} \geq 13$$
$$Rt^{1/2} \leq 40$$

where

R and t are in millimeters.

B 453,238

APPARATUS FOR HIGH-SPEED ACCURATE COUNTING AND HANDLING OF DISCRETE OBJECTS SUCH AS TABLETS

Jim Mills Adams, West Caldwell, and Edward Francis DeZabala, Pequannock, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Mar. 21, 1974, Ser. No. 453,238

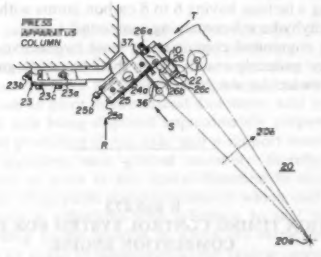
Int. Cl.² G07F *11/00*

U.S. Cl. 214—1 C **2 Claims**

References Cited

UNITED STATES PATENTS

3,081,588	3/1963	Klapes et al.	53/78
3,139,713	7/1964	Merrill et al.	53/78 X
3,558,004	1/1971	Boyd, Jr. et al.	221/7
3,677,437	7/1972	Haigler	221/7
3,837,139	9/1974	Roseberg	221/7 X



1. A counting and handling system for use with high-speed apparatus making discrete, solid particular objects comprising:

a. sensing means including a sensing arrangement predeterminably arranged relative to each station of the apparatus at which the formation of the objects is virtually com-

pleted, at least one said sensor arrangement including a strain detecting sensor for providing a sensing signal whenever an object is properly formed;

b. control counter means responsive to said sensing means for providing a separate continuous count of the objects sensed by each said sensor arrangement, said counter means including first means enabling a separate presetting of the maximum desired count of sensed objects for each said station of the apparatus; and

c. gating and handling means including a gated dispensing arrangement associated with each said station of the apparatus and having a first portion thereof situate proximate the said respective station, each said gated dispensing arrangement being adapted to predeterminably control the procession of the objects from the respective station of the apparatus to a pre-established destination under the supervision of said first means.

B 474,645

TRANSPARENT, NON-BLOOMING POLY(LACTONE-URETHANE) INTERLAYERS FOR LAMINATED SAFETY GLASS

Wen-Hsuan Chang, Gibsonia, and Vernon G. Ammons, Glenshaw, both of Pa., assignors to PPG Industries, Incorporated, Pittsburgh, Pa.

Filed May 30, 1974, Ser. No. 474,645
Int. Cl.² C08G *18/64*
U.S. Cl. 260—77.5 AN **23 Claims**

References Cited
UNITED STATES PATENTS

3,169,945	2/1965	Hostettler et al.	260/77.5 AN
3,186,971	6/1965	Hostettler et al.	260/77.5 AN
3,651,021	3/1972	Kincaid et al.	260/77.5 AN
3,654,347	4/1972	Kincaid et al.	260/77.5 AN
3,660,357	5/1972	Kolycheck	260/77.5 AN
3,741,918	6/1973	Koleske et al.	260/77.5 AN
3,746,665	7/1973	Koleske et al.	260/77.5 AN
3,806,495	4/1974	Schoen	260/77.5 AN
3,823,060	7/1974	McClung	260/77.5 AT

1. A non-blooming polyurethane article in sheet form comprising the polymerizate of:

a. an organic polyisocyanate,

b. a polylactone polyol having a hydroxyl number within the range of 62 to 140 inclusive formed from ring opening a lactone having 6 to 8 carbon atoms with an organic polyhydroxyl-containing compound,

c. a compound containing at least two active hydrogens per molecule reactive with the isocyanate group having a molecular weight less than 250.

B 480,473

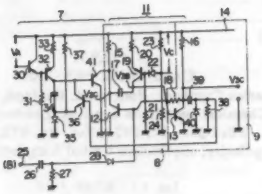
IGNITION TIMING CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

Seiji Suda, Mito, Japan, assignor to Nissan Motor Co., Ltd. and Nissan Motor Co. Ltd., both of Tokyo, Japan

Filed June 18, 1974, Ser. No. 480,473
Int. Cl.² F02P *1/00*
U.S. Cl. 123—148 E **7 Claims**

References Cited
UNITED STATES PATENTS

3,550,571	12/1970	Mainprize	123/148 E
3,559,629	2/1971	Sauvignet	123/148 E
3,587,552	6/1971	Varaunt	123/148 E
3,592,178	10/1969	Schiff	123/117 R
3,660,689	5/1972	Oishi et al.	123/148 E
3,738,339	6/1973	Huntzinger et al.	123/146.5 A
3,800,757	4/1974	Finch	123/117 R
3,890,944	6/1975	Werner	123/148 E



1. An ignition timing control system for an internal combustion engine comprising, in combination:

first means for generating a first pulse reference signal in synchronism with the rotation of the engine;

second means for generating an advance angle control signal representative of the operating condition of the engine;

third means, coupled to said first and second means, for generating a first voltage, the amplitude of which is proportional to the lapse of time from the generation of the first pulse reference signal from said first means, and including a first charge storage circuit, and a first constant current circuit connected thereto for supplying a constant charging current to said first charge storage circuit in accordance with the advance angle control signal from said second means, the charge stored by said first charge storage circuit corresponding to said first voltage;

fourth means, coupled to said first and third means, for generating a second voltage, the amplitude of which decreases along a prescribed linear gradient from the level of said first voltage toward a first reference voltage in response to the receipt of a first pulse reference signal from said first means, and including a first switching circuit and a second charge storage circuit coupled thereto, said second charge storage circuit being coupled to said first charge storage circuit to store a charge corresponding to level of said first voltage, said switching circuit being coupled to receive said first pulse reference signal so as to initiate the discharge of said second charge storage circuit in response thereto, so that said second charge storage circuit produces a voltage corresponding to said second voltage decreasing along said prescribed linear gradient and to terminate the discharge of said second charge storage circuit upon the level of said second voltage reaching the level of said first reference voltage; and

fifth means, coupled to said fourth means, for generating an output signal upon the level of said second voltage reaching the level of said first reference signal.

B 484,332

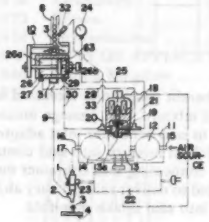
FLUID SERVICING UNIT FOR AUTOMATIC FASTENER FEEDING AND DRIVING APPARATUS

Yubi Mori, Neyagawa; Yasuyuki Igaki, Kyoto, and Syunji Sugahara, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed June 28, 1974, Ser. No. 484,332
Claims priority, application Japan, July 2, 1973, 48-74998
Int. Cl.[2] B25B *23/00*; H01M *6/00*
U.S. Cl. 144—32 R 4 Claims

References Cited
UNITED STATES PATENTS

3,581,370	6/1971	Passarella et al.	144/32 X
3,648,744	3/1972	Bangerter	144/32



1. A fluid servicing unit for an automatic fastener feeding and driving apparatus which has a fastener container, a fluid operated fastener driving tool, a fluid operated mechanism for feeding fasteners from the fastener container to an escapement mechanism from which the fasteners are fed one by one to a fluid operated driving tool, and an electrical control unit for controlling the operation of the apparatus, said servicing unit comprising:

air treatment means connected at an inlet to an air source for filtering, selectively pressure regulating, and selectively oil atomizing air passing therethrough, said air treatment means further having first and second outlets, the second outlet being connected to said fluid operating driving tool and emitting said oil atomized air therethrough; and

electromagnetic valve assembly means operatively pneumatically connected to said first outlet from said air treatment means from which said pressure regulated air is emitted and connected to said escapement mechanism for regulating the flow of air to said escapement and feed mechanism in response to an electrical signal directed and sent thereto from said electrical control unit.

B 487,427

VEHICLE SENSITIVE RETRACTOR WITH IMPROVED UNIVERSAL PENDULUM AND GIMBAL

Robert L. Stephenson, Sterling Heights; Robert C. Pfeiffer, Rochester, and Yogendra Singh Loomba, Washington, all of Mich., assignors to Allied Chemical Corporation, New York, N.Y.

Filed July 10, 1974, Ser. No. 487,427
Int. Cl.[2] B65H *75/48*
U.S. Cl. 242—107.4 A 6 Claims

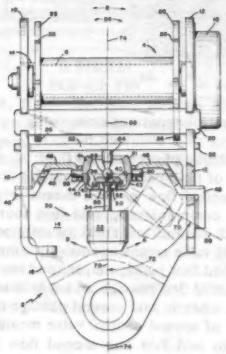
References Cited
UNITED STATES PATENTS

3,489,367	1/1970	Kovacs et al.	242/107.4
3,552,676	1/1971	Weber	242/107.4

1. In a vehicle-sensitive, inertia operated safety belt retractor having a reel for winding a safety belt, means to lock the reel and thereby restrain an occupant of a vehicle during emergency situations, an inertia mechanism, a support assembly mounted on said retractor for supporting the inertia mechanism, and an actuating means responsive to said inertia mechanism for operating the means for locking the reel; the improvement wherein:

said inertia mechanism is a pendulum assembly which includes a pendulum head in contact with said actuating means, said pendulum assembly being actuated by forces exceeding a predetermined magnitude resulting from a sudden change in the motion or orientation of the vehicle, said actuation means operating directly on the means for locking the reel without any intermediate mechanism disposed structurally or operatively between said actuating means and said means for locking the reel; and

said support for said pendulum assembly is a gimbal assembly which includes: a pivot ring which is a concave vessel having a substantially circular support edge upon which said pendulum head is disposed, said pendulum assembly being adapted to pivot upon said support edge in an infinite variety of lateral directions, said pendulum assembly requiring a force exceeding a predetermined magnitude to lift a part of the pendulum head up and off a part of said support edge before said pendulum assembly will cause said locking means to lock the reel; a swivel axis for said pivot ring adapted to allow said pivot ring to pivot in two lateral directions, a trunnion for supporting said pivot ring; a swivel axis for said trunnion adapted to allow said trunnion to pivot in two lateral directions, said trunnion swivel axis being disposed approximately perpendicular to said pivot ring swivel axis, and a support member for said trunnion, said gimbal assembly thereby being adapted to pivot in any lateral direction to an infinite variety of operable static positions to which said gimbal assembly is adjustable with reference to said retractor according to the position in which the retractor is oriented by virtue of installation in the vehicle; upon actuation by forces resulting from a sudden change in the motion or orientation of the vehicle said pivot ring and said pendulum assembly having independent action and pivoting in opposite directions; said pendulum assembly and said gimbal assembly having a compact configuration, sufficiently compact for said pendulum assembly and said gimbal assembly to be mounted either within said retractor or outside said retractor.



B 490,623

CONTROL APPARATUS PARTICULARLY FOR A PLURALITY OF COMPRESSOR BLEED VALVES OF A GAS TURBINE ENGINE

Howard L. McCombs, South Bend, Ind.

Division of Ser. No. 289,404, Sept. 15, 1972, Pat. No. 3,848,636. This application July 22, 1974, Ser. No. 490,623

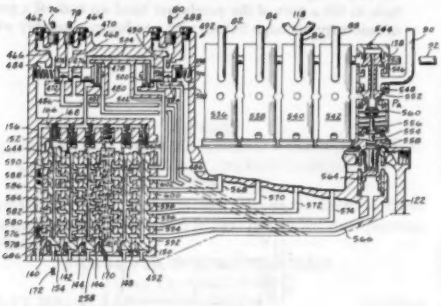
Int. Cl.² F16K *11/20*

U.S. Cl. 137—608 **8 Claims**

References Cited

UNITED STATES PATENTS

1,968,422	7/1934	Proctor	137/106
3,134,395	5/1964	Glasgow	137/614.21 X
3,283,779	11/1966	Rosaen	137/625.6 X
3,556,144	1/1971	Bickers	137/608 X
3,650,295	3/1972	Smith	137/625.24 X
3,805,837	4/1974	Stampfli	137/625.6



1. Fluid control apparatus comprising:

a first source of pressurized fluid;

a second source of pressurized fluid;

a plurality of fluid pressure responsive means;

first and second flow passage means in parallel flow relationship communicating said first source of pressurized fluid with each of said fluid pressure responsive means;

first control valve means operatively connected to said first and second flow passage means and having a first position wherein said first passage means is blocked and a second position wherein said second passage means is blocked;

a plurality of second control valve means operatively connected to said first and second flow passage means in series flow relationship and provided with port means for venting one of said first and second flow passage means to said second source of pressurized fluid depending upon the relative positions of said plurality of second valve means; and

means responsive to a control input signal operatively connected to each of said first and second valve means for actuating the same from a first position to a second position.

B 498,951

FUEL INDUCTION SYSTEM

Frederick J. Marsee, Clawson, Mich., assignor to Ethyl Corporation, Richmond, Va.

Filed Aug. 20, 1974, Ser. No. 498,951

Int. Cl.² F02M *31/00*

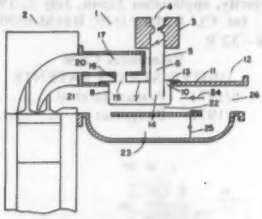
U.S. Cl. 123—122 AC **15 Claims**

References Cited

UNITED STATES PATENTS

1,854,298	4/1932	Godward	123/122 AC
3,037,493	6/1962	Burch	123/52 MV
3,717,131	2/1973	Chana	123/52 MV
3,809,032	5/1974	Morris	123/52 MV

1. A fuel induction system for a spark-ignited multicylinder internal combustion engine comprising in combination a carburetor, an intake manifold, an exhaust gas conduit and an evaporation container having an inlet and an outlet, said exhaust gas conduit having an opening in its side wall adapted to sealably engage and hold said evaporation container such that a non-perforate portion of said container extends into said exhaust conduit, said carburetor having at least one primary barrel wherein gasoline is atomized into air to form a primary air/fuel mixture, first passage means connecting said primary barrel to said container inlet adapted to deliver all of said primary air/fuel mixture into said container, and second passage means connecting said container outlet to said intake manifold adapted to deliver said primary air/fuel mixture from said container into said intake manifold.



B 501,975

FLEXIBLE SEALING BOOT

Toshio Kondo, Chiruy, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Japan

Filed Aug. 30, 1974, Ser. No. 501,975

Claims priority, application Japan, Aug. 31, 1973, 48-102981

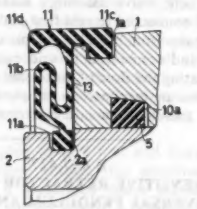
Int. Cl.² F16J *15/52*

U.S. Cl. 74—18.2 **3 Claims**

References Cited

UNITED STATES PATENTS

3,535,942	10/1970	Kateb	74/18.2
3,712,422	1/1973	Haraikawa et al.	188/72.5



1. A sealing boot of elastic material for use in a cylinder and piston assembly of a vehicle brake system comprising, as integrally formed parts thereof:

an inner sleeve portion for elastic mounting in a peripheral groove of said piston,

an outer sleeve portion for elastic mounting in a peripheral groove of said cylinder, and

a flexible bellow portion connecting said inner sleeve portion to said outer sleeve portion,

said outer sleeve portion being provided with an integral thick flange portion which interconnects said bellow sleeve portion and said outer sleeve portion and which extends axially with respect to said cylinder from said peripheral groove of said cylinder beyond the outside of an open end of said cylinder such that the entire axial length of the outer portion of said boot includes a sub-

stantially thickened portion which comprises said outer sleeve portion and said flange portion.

B 505,689
METHOD AND APPARATUS FOR COOLING HEAT ENGINES

László Heller; László Forgó, and György Frank, all of Budapest, Hungary, assignors to Transelektro Magyar Villamossagi Kulkereskedelmi Vallalat, Budapest, Hungary

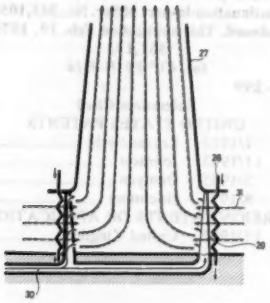
Filed Sept. 13, 1974, Ser. No. 505,689
Int. Cl.² F02C 7/12; F28F 13/12
U.S. Cl. 60—690 **5 Claims**

References Cited
UNITED STATES PATENTS

3,488,960	1/1970	Kirkpatrick	60/686
3,760,869	9/1973	Brown	261/DIG. 11
3,846,519	11/1974	Spangemacher	60/690

FOREIGN PATENTS OR APPLICATIONS

525,702	9/1940	United Kingdom	165/DIG. 1
567,196	9/1930	Germany	261/DIG. 11



1. In combination with a heat engine producing a hot gas and having at least one fluid flowing to cool the engine, a cooling tower for the upward convective flow therein of air, an indirect heat exchanger adjacent the base of the tower for cooling said fluid by the flow of air past said heat exchanger in indirect heat exchange with said fluid and up through said tower, and means for introducing into said tower at least a portion of said hot gas thereby to augment the upward convective flow of air through said tower, said introducing means comprising conduit means located immediately downstream of said heat exchanger with respect to the direction of air flow past said heat exchanger, said conduit means extending across the path of said air transversely of the direction of said air flow, said conduit means having a plurality of outlets spaced apart in said transverse direction and facing in said downstream direction.

B 507,661
BEARING ASSEMBLY WITH MEANS FOR COMPENSATING FOR DIFFERENTIAL EXPANSION

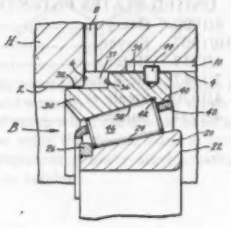
Robert F. Cornish, North Canton, Ohio, assignor to The Timken Company, Canton, Ohio

Filed Sept. 20, 1974, Ser. No. 507,661
Int. Cl.² F16C 13/00
U.S. Cl. 308—207 R **11 Claims**

References Cited
UNITED STATES PATENTS

3,447,849	6/1969	Harris et al.	308/214
3,704,498	12/1972	Rundt	308/214
3,716,280	2/1973	Leibensperger et al.	308/207 A

1. A bearing assembly comprising: a cone for receiving a shaft and having an outwardly presented tapered raceway; a cup surrounding the cone and having an inwardly presented tapered raceway, the cup further having an annular radial surface; tapered rollers between the cup and cone and having their tapered side faces against the tapered raceways; roller positioning means for preventing the tapered rollers from being expelled from the space between the two raceways; and



a housing in which the cup is loosely received so that the cup can move axially in the housing, the housing having a cavity containing a fluid which is exposed to the annular radial surface of the cup so that the fluid when pressurized in the cavity will exert an axially directed force on the cup and cause the rollers to seat snugly against the raceways and the positioning means.

B 510,521
POP-UP FIN

Violet C. Minnich, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

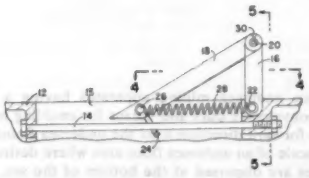
Filed Sept. 30, 1974, Ser. No. 510,521
Int. Cl.² F42B 13/32
U.S. Cl. 244—3.27 **7 Claims**

References Cited
UNITED STATES PATENTS

3,188,957	6/1965	Petre	244/3.27
3,826,448	7/1974	Burk, Jr.	244/3.27 X

FOREIGN PATENTS OR APPLICATIONS

1,203,647	10/1965	Germany	244/3.27

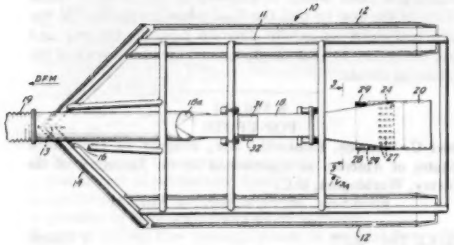


1. A missile having a pop-up fin comprising an elongated slot in an opening of said missile housing, a blade pivotally mounted at one end of said slot to said missile, a second blade pivotally mounted at one end to the other end of said first blade, the other end of said second blade having means thereon for slidably mounting and guiding said other end of said second blade along a longitudinal path relative to means secured within said missile, and spring means in tension mounted at said other end of said second blade and at said pivotal mounting at said one end of said first blade to bias said first and second blades outwardly and cause said other end of said second blade to slide along said means secured within said missile to cause said blades to be extended into a triangular like shape of a fin.

B 531,753
MINING TRANSITION CHAMBER
Frank Howard Brockett, III, Bellevue, Wash., assignor to The International Nickel Company, Inc., New York, N.Y.
Filed Dec. 11, 1974, Ser. No. 531,753
Int. Cl.[2] E02F 3/92
U.S. Cl. 37—57 **10 Claims**

References Cited
UNITED STATES PATENTS

646,490	4/1900	Deery	302/58 X
867,492	10/1907	Frayer	37/58
2,889,779	6/1959	Hofer	37/58 X
3,329,287	7/1967	De Koning	37/58
3,504,943	4/1970	Steele et al.	299/8
3,802,740	4/1974	Sullivan	37/DIG. 8



1. In an undersea mining apparatus having a hydraulic suction conveyance duct and means for enabling moving the duct in a forward direction over the undersea floorline in the mining locale of an undersea floor area where desired mineral aggregates are dispersed at the bottom of the sea, said duct being adapted to transmit a mixture of liquids and solids by hydraulic suction flow from the duct entrance to the duct exit at a desired location, the improvement comprising in combination with the conveyance duct and the forward movement means, a liquid-solid flow transition chamber having a solids entrance, a water entrance, an exit port, and a throat portion, said chamber entrances and exit port being disposed with the solids entrance facing in the forward direction, with the water entrance facing aft, with the exit port above and longitudinally between the solids entrance and the water entrance and facing forwardly and upwardly and being joined to the entrance end of the conveyance duct and with the throat portion longitudinally between the water entrance and the exit port, the cross-sectional areas of said entrances and port being in corelationships to the cross-sectional area of the conveyance duct whereby the solids entrance area is less, the water entrance area is greater and the exit port area and throat area are equal to the conveyance duct area; and means to support the bottom of the solids entrance and the bottom of the water entrance at least as high as the undersea floorline when the conveyance duct and the chamber are moved forwardly over the undersea floorline.

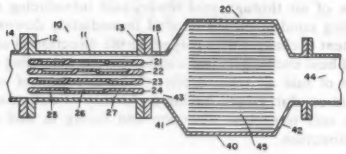
B 551,133
EXHAUST SYSTEMS
Leonard M. Niebylski, Birmingham, Mich., assignor to Ethyl Corporation, Richmond, Va.
Continuation-in-part of Ser. No. 368,741, June 11, 1973, which is a continuation-in-part of Ser. No. 343,105, March 20, 1973, abandoned. This application Feb. 19, 1975, Ser. No. 551,133
Int. Cl.[2] F01N 3/14
U.S. Cl. 60—299 **9 Claims**

References Cited
UNITED STATES PATENTS

1,893,372	1/1933	Kryzanowski	60/299
3,109,715	11/1963	Johnson	60/299
3,185,181	5/1965	Demyan	138/37
3,597,166	8/1971	Hochman	23/288 F

FOREIGN PATENTS OR APPLICATIONS

910,057	11/1962	United Kingdom	23/288 FR



1. In an exhaust system for an internal combustion engine, said system comprising a catalytic reactor containing a catalyst bed, said catalytic reactor being operatively connected by exhaust conduit means to receive the exhaust gas from said internal combustion engine, the improvement which comprises a plurality of substantially parallel proximately spaced vanes located in the exhaust flow path between said engine and said catalyst bed, the surface of said vanes being substantially aligned with said exhaust flow path, said vanes having elongated recesses in their surface.

B 586,380

AROMATIC COMPOSITIONS

Edouard P. Demole, Geneva, Switzerland, assignor to Firmenich SA, Geneva, Switzerland

Division of Ser. No. 482,776, June 24, 1974. This application June 12, 1975, Ser. No. 586,380

Claims priority, application Switzerland, Jan. 19, 1971, 773/71; June 23, 1971, 9156/71; Jan. 11, 1972, 380/72

Int. Cl.[2] A24B *3/14*, *13/00*, *15/08*

U.S. Cl. 131—144 3 Claims

References Cited

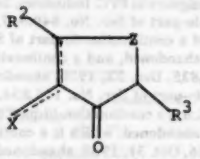
UNITED STATES PATENTS

3,380,456 4/1968 Roberts et al. ..... 131/17 R

FOREIGN PATENTS OR APPLICATIONS

138,612 10/1960 U.S.S.R. 131/144

1. A process for improving, enhancing or modifying the organoleptic properties of a tobacco product, which comprises adding thereto about 1 to about 1000 parts per million based on the weight of tobacco of at least one compound selected from the group of compounds having the following formula



containing a double bond in one of the positions indicated by the dotted lines, and wherein X represents either a hydrogen atom or a hydroxyl group when the double bond is in the ring, or an oxygen atom when the double bond is external to the ring, R^2 and R^3 represent a lower alkyl substituent, and Z stands for oxygen or sulphur.

B 167,470

ELECTRODEPOSITION OF EPOXY COMPOSITIONS

Joseph F. Bosso, Lower Burrell, and Marco Wismer, Gibsonia, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 840,847, July 10, 1969, abandoned, and a continuation-in-part of Ser. No. 840,848, July 10, 1969, abandoned, and a continuation-in-part of Ser. No. 100,825, Dec. 22, 1970, abandoned, and a continuation-in-part of Ser. No. 100,834, Dec. 22, 1970, abandoned, which is a continuation-in-part of Ser. No. 56,730, July 20, 1970, abandoned, which is a continuation-in-part of Ser. No. 772,366, Oct. 31, 1968, abandoned. This application July 29, 1971, Ser. No. 167,470

Int. Cl.[2] C25D *13/06*

U.S. Cl. 204—181 — 19 Claims

References Cited

UNITED STATES PATENTS

3,301,804	1/1967	Zora et al.	204/181
3,399,128	8/1968	Brewer et al.	204/181
3,640,926	2/1972	Slater et al.	204/181

1. A method of coating a conductive substrate serving as a cathode which comprises passing electric current between an anode and said cathode in electrical contact with a water-dispersed composition comprising an aqueous dispersion comprising an ungelled, water-dispersible epoxy resin having in the resin molecule:

a. at least one 1,2-epoxy group,

b. at least about 0.05 percent by weight of chemically-bound nitrogen, at least one percent of which is in the form of a quaternary ammonium base salt of an acid having a dissociation constant greater than about 1×10^{-5},

c. said water-dispersed composition containing boron in the form of boric acid, an ester of boric acid or a compound which can be cleaved to form boric acid in aqueous medium.

B 367,305

PHOTOGRAPHIC ELEMENTS CONTAINING N-OXIDE OXIDANTS

Samuel J. Ciurca, Jr., and Albert T. Brault, both of c/o Kodak Park Division, 1669 Lake Ave., Rochester, N.Y. 14650

Filed June 5, 1973, Ser. No. 367,305

Int. Cl.[2] G03C *7/00, 5/54, 1/48, 1/06*

U.S. Cl. 96—54 — 18 Claims

References Cited

UNITED STATES PATENTS

2,559,643	7/1951	Land	96/76 R
2,661,293	12/1953	Land	96/76 R
2,698,798	1/1955	Land	96/76 R
2,892,710	6/1959	Cohler et al.	96/95
2,992,105	7/1961	Corley et al.	96/29 D
3,065,074	11/1962	Rogers	96/29 D
3,173,929	3/1965	Kasman	260/371
3,340,063	9/1967	Kalenda	96/95
3,384,484	5/1968	Schranz et al.	96/77
3,698,897	10/1972	Gompf et al.	96/77
3,709,690	1/1973	Cohen et al.	96/67

FOREIGN PATENTS OR APPLICATIONS

1,326,889	8/1973	United Kingdom
2,126,954	12/1971	Germany

1. A photographic element comprising a support having thereon at least one photographic dye-image receiving layer and at least one layer containing at least 40 mg per ft² of an aromatic heterocyclic N-oxide oxidant having a polarographic reduction potential more positive than about −0.5 v when in an aqueous solution comprising 4% potassium hydroxide.

15. A photographic element comprising a support having thereon at least one photographic silver halide emulsion layer and at least 40 mg per ft² of an aromatic heterocyclic N-oxide oxidant having a polarographic reduction potential more positive than about −0.5 v when in an aqueous solution comprising 4% potassium hydroxide.

B 391,473

AMIDINOUREAS

Royal A. Cutler, Sand Lake, and Samuel Schalit, Albany, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 79,266, Oct. 8, 1970, Pat. No. 3,798,269, which is a division of Ser. No. 749,986, Aug. 5, 1968, Pat. No. 3,652,766, which is a continuation-in-part of Ser. No. 556,897, June 13, 1966, abandoned, which is a continuation-in-part of Ser. No. 462,077, June 7, 1965, abandoned. This application Aug. 24, 1973, Ser. No. 391,473

Int. Cl.[2] C07C *127/15*

U.S. Cl. 260—553 R — 3 Claims

References Cited

UNITED STATES PATENTS

3,798,269	3/1974	Cutler et al.	260/553 R

FOREIGN PATENTS OR APPLICATIONS

954,114	4/1964	United Kingdom

OTHER PUBLICATIONS

Dutta et al., Journ. Indian Chem. Soc., Vol. 36, No. 7, pp. 499–504, (1959).

Ray, Chemical Reviews, Vol. 61, p. 323, (1961).

1. 1-Amidino-3-decylurea.

2. 1-Amidino-3-undecylurea.

3. 1-Amidino-3-dodecylurea.

B 395,975

IMMOBILIZATION OF ENZYMES ON AN INORGANIC MATRIX

Melvin H. Keyes, Sylvania, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Sept. 10, 1973, Ser. No. 395,975

Int. Cl.[2] C07G *7/02*

U.S. Cl. 195—68 — 8 Claims

References Cited

UNITED STATES PATENTS

2,717,852	9/1955	Stone	195/63 X
3,666,627	5/1972	Messing	195/63
3,705,084	12/1972	Reynolds	195/63
3,850,751	11/1974	Messing	195/63

1. A process for depositing and immobilizing an enzyme on an inert, inorganic, porous, sorptive, dimensionally stable, liquid permeable metal oxide supporting matrix having been formed by compacting and sintering a refractory metal oxide powder, said matrix being sufficiently porous to be enzyme and substrate permeable, and having a porosity in the range of about 10 percent to about 80 percent and an average pore diameter in the range of about 0.01 to 10 microns, said process comprising contacting an aqueous dispersion of said enzyme with said matrix, applying at least about 10 psig pressure to said dispersion to cause substantial amounts of said dispersion to flow through said matrix,

maintaining the flow of said dispersion through said matrix for a sufficient time period of at least about 5 minutes to immobilize said enzyme directly on said matrix to form an enzymatically active composite.

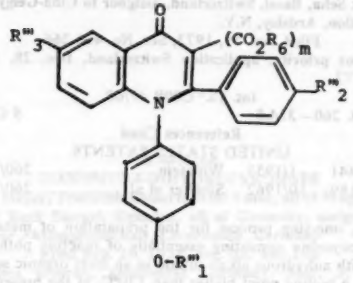
B 402,162
CERTAIN
1,2-DIPHENYL-1,2,3,4-TETRAHYDROQUINOLINE COMPOUNDS

Malcolm R. Bell, East Greenbush, N.Y., assignor to Sterling Drug Co., New York, N.Y.

Division of Ser. No. 156,070, June 23, 1971, Pat. No. 3,819,637. This application Oct. 1, 1973, Ser. No. 402,162
Int. Cl.² C07D *215/12*
U.S. Cl. 260—288 R **11 Claims**

References Cited
OTHER PUBLICATIONS
Pocha et al., "J. Pharm. Sci." Vol. 56, 1967, pp. 1042–1044.

1. A compound of the formula



where R'''_1 is hydrogen, lower-alkyl, benzyl, or $C_nH_{2n}NR_4R_5$,
where R_4 and R_5 are lower-alkyl or R_4 and R_5 together with nitrogen form a heterocyclic ring selected from 1-pyrrolidyl and 1-piperidyl and such rings substituted on carbon by one to three non-tertiary lower-alkyl substituents, and *n* is an integer from 2 to 4 inclusive;
R'''_2 and R'''_3 are hydrogen, lower-alkyl, lower-alkoxy or halo;
R_6 is hydrogen or lower-alkyl and *m* is 0 or 1;
where lower-alkyl and lower-alkoxy have from one to six carbon atoms.

B 417,164
METHOD FOR PREPARING PULVERULENT POLYMERS EXHIBITING AN APPARENT INCREASE IN GLASS TRANSITION TEMPERATURE AND SHAPING THE RESULTANT POLYMER MATERIALS

William J. Davis, 1700 Reading Blvd., Wyomissing, Pa. 19610, and Anthony J. Izbicki, 225 Park Ave., Hyde Park, Reading, Pa. 19605

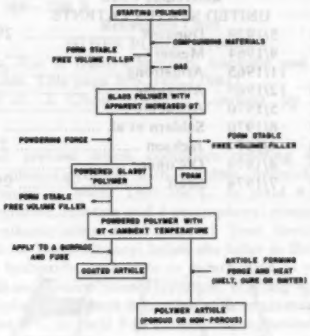
Continuation of Ser. No. 215,565, Jan. 5, 1972, abandoned. This application Nov. 19, 1973, Ser. No. 417,164
Int. Cl.² B29D *27/00, 27/08*
U.S. Cl. 264—49 **13 Claims**

References Cited
UNITED STATES PATENTS

2,858,282	10/1958	Fairclough	264/50 X
2,875,047	2/1959	Oster	260/17.4 SG
3,179,607	4/1965	Suda et al.	260/17.4 SG
3,215,647	11/1965	Dunn	264/50 UX
3,650,995	3/1972	Erickson	264/50 X

OTHER PUBLICATIONS
The Condensed Chemical Dictionary, Seventh Edition, completely revised and enlarged by Arthur and Elizabeth Rose, New York, Reinhold, c 1966, p. 544.

1. A method for preparing a polymer in pulverulent form comprising the steps of dissolving a sugar into a liquid suspension of finely divided particles of the polymer, coagulating with precipitation the polymer suspension removing the liquid



from the coagulated and precipitated suspension to form a dried polymer mass, comminuting the dried polymer mass and removing the sugar from the comminuted polymer mass.

B 419,582
7-AZOXY SUBSTITUTED-1,4-BENZODIAZEPIN-2-ONES

Rodney Ian Fryer, North Caldwell, and Armin Walser, West Caldwell, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

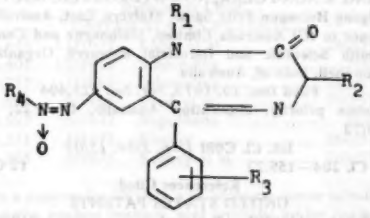
Filed Nov. 28, 1973, Ser. No. 419,582
Int. Cl.² C07C *107/04*
U.S. Cl. 260—143 **3 Claims**

References Cited
UNITED STATES PATENTS

3,567,710	3/1971	Fryer et al.	260/239.3
3,784,542	1/1974	Hellerbach et al.	260/239.3 D

OTHER PUBLICATIONS
Roth et al., Chemical Abstracts, Vol. 71, (1969), 112898w.

1. A compound of the formula



wherein
R_1 is selected from the group consisting of hydrogen, lower alkyl, C_3 to C_7 cycloalkyl-lower alkyl, hydroxy-lower alkyl, lower alkoxy-lower alkyl and dilower alkylamino-lower alkyl;
R_2 signifies hydrogen or lower alkyl;
R_3 signifies hydrogen or halogen;
R_4 signifies lower alkyl
or the pharmaceutically acceptable acid addition salts thereof.

B 421,975

EXPANDABLE METAL MEMBRANE

Richard T. Parmley, Cupertino, Calif., assignor to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed Dec. 5, 1973, Ser. No. 421,975

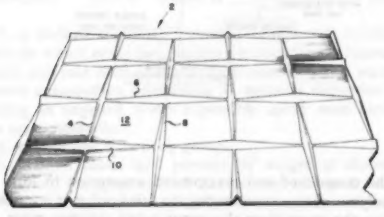
Int. Cl.[2] B22F *5/00*

U.S. Cl. 29—180 SS **6 Claims**

References Cited

UNITED STATES PATENTS

2,158,929	5/1939	Dunajeff	29/180 SS
3,150,793	9/1964	Messer	220/9 R
3,215,301	11/1965	Armstrong	220/9 LG
3,485,596	12/1969	Alleaume	29/183
3,510,278	5/1970	Alleaume	29/183
3,517,850	6/1970	Saldern et al.	220/9 R
3,800,970	4/1974	Jackson	220/9 LG
3,802,853	4/1974	O'Connor	29/183
3,824,664	7/1974	Seeff	29/180 SS



1. An expandable metal membrane for use under conditions of large temperature changes comprising:

a first set of simple tapered expansion wedges defining a first set of substantially parallel spaced corrugations, each of said tapered wedges in said first set defined as terminating in an apex at one end and tapering to a point at the other end,

a second set of simple tapered expansion wedges defining a second set of substantially parallel spaced corrugations, each of said tapered wedges in said second set defined as terminating in an apex at one end and tapering to a point at the other end,

said second set of corrugations being mutually perpendicular with said first set of corrugations and defining a plurality of flat enclosed areas.

B 423,404

RADIATION POLYMERIZATION OF TRIALLYLAMINES USING A NON-POLAR, NON-HYDROXYLIC SOLVENT

Wolfgang Hermann Fritz Sasse, Malvern East, Australia, assignor to ICI Australia Limited, Melbourne and Commonwealth Scientific and Industrial Research Organization, Campbell, both of, Australia

Filed Dec. 10, 1973, Ser. No. 423,404

Claims priority, application Australia, Dec. 22, 1972, 1719/72

Int. Cl. C08f *1/16, 3/84, 15/02*

U.S. Cl. 204—159.22 **12 Claims**

References Cited

UNITED STATES PATENTS

3,619,394	11/1971	Battaerd	260/89.7 N
3,676,398	7/1972	D'Alelio	260/47 EP
3,721,648	3/1973	Ehrig et al.	260/47 UA
3,759,809	9/1973	Carlick et al.	204/159.23
3,814,677	6/1974	Battaerd	204/159.22

1. In the process of polymerising a composition comprising a mixture of monomers said monomer mixture containing from 3 to 100% of amines chosen from the group consisting of triallylamine, diallylamine, 1,4-bis(N,N-diallylaminomethyl) benzene, 1,3,5-tris-(N,N-diallylaminomethyl) benzene, N-(4-N,N-dimethylbenzyl)diallylamine, N-(4-N,N-diallylaminomethylbenzyl) diallylamine, N-(4-N,N-dipropylaminomethylbenzyl) diallylamine, N-(4-N,N-diisopropylaminomethylbenzyl) diallylamine, alkyldiallylamines and N,N,N′,N′-tetraallylalkanediamines, which method comprises irradiating a solution of a hydrofluoride, hydrochloride or sulphate salt of said amine with electromagnetic radiation and isolating the polymer so formed, the improvement comprising using radiation having a wavelength greater than 180 nanometers at a temperature in the range from −80° to 120°C and using a non-polar and non-hydroxylic solvent.

B 426,266

PROCESS FOR THE PREPARATION OF METAL-FREE PHTHALOCYANINE

Zdenek Seha, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 19, 1973, Ser. No. 426,266

Claims priority, application Switzerland, Dec. 28, 1972, 19002/72

Int. Cl.[2] C09B *47/08*

U.S. Cl. 260—314.5 **5 Claims**

References Cited

UNITED STATES PATENTS

2,699,441	1/1955	Wittstein	260/314.5
3,060,189	10/1962	Stocker et al.	260/314.5

1. A one-step process for the preparation of metal-free phthalocyanine consisting essentially of reacting phthalonitrile with anhydrous alkali sulfide in an inert organic solvent having a boiling point higher than 130°C, in the presence of 0.5 to 3 equivalents of an alcohol having a boiling point higher than 130°C, at a temperature of between 100°C and the boiling point of the solvent and alcohol, wherein said reactants are in the ratio of 4 moles of phthalonitrile to 0.05–0.3 moles of alkali sulfide.

B 437,894

METHOD FOR THE PRODUCTION OF PRINTING PLATES USING PHOTOSENSITIVE COMPOSITIONS

Helmut Barzynski, Lambsheim, and Peter Richter, Mannheim, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Division of Ser. No. 182,873, Sept. 22, 1971, abandoned. This application Jan. 30, 1974, Ser. No. 437,894

Claims priority, application Germany, Oct. 9, 1970, 2049621

Int. Cl.[2] G03C *1/70;* **G03F** *7/08*

U.S. Cl. 96—33 **4 Claims**

References Cited

UNITED STATES PATENTS

3,036,915	5/1962	Notley	96/84
3,740,224	6/1973	Barzynski	96/33

1. A process for the production of printing plates using a photosensitive composition consisting essentially of an intimate blend of

A. 40 to 97% by weight, with reference to the whole blend A + B, of a mixture of

A.1. 15 to 80% by weight, with reference to A, of a water-soluble linear N-vinylpyrrolidone polymer having a molecular weight of at least 1000, and

A.2. 20 to 85% by weight, with reference to A, of a polymer or copolymer of an olefinically unsaturated carboxylic acid having 3–6 carbon atoms which is soluble or swellable in water or aqueous alkali and has a molecular weight of at least 500, the content of carboxyl groups therein being at least 5% by weight based on the polymeric polycarboxylic acid, and

B. 3 to 60% by weight, with reference to the whole blend A + B, of olefinically unsaturated monomers which are compatible with mixture A (A.1 + A.2), which do not

boil below 100°C at atmospheric pressure, and of which the portion having more than one photo polymerizable olefinically unsaturated double bond predominates,

which comprises applying a thin layer of said composition to supports and exposing said layer through an at least partially transparent negative or positive without subsequent development processing.

B 445,166

2-AMINO-3,4-DIHYDROPYRIDINES

Horst Meyer; Friedrich Bossert; Wulf Vater, all of Wuppertal, and Kurt Stoepel, Opladen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 25, 1974, Ser. No. 445,166

Claims priority, application Germany, Mar. 3, 1973, 2310747

Int. Cl.² 424 *258, 266*

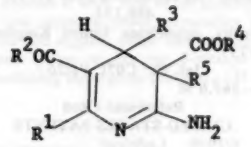
U.S. Cl. 260—294.8 G **15 Claims**

References Cited

UNITED STATES PATENTS

3,855,231 12/1974 Meyer et al. ..... 260/294.8 F

1. A compound of the formula:



wherein

R^1 is hydrogen, straight or branched chain lower alkyl, or amino;

R^2 is straight or branched chain lower alkyl or OR′ wherein R′ is straight or branched chain lower alkyl, lower alkenyl, lower alkynyl or alkoxyalkyl of 2 to 4 carbon atoms;

R^3 is straight or branched chain alkyl of 1 to 6 carbon atoms; straight or branched chain alkenyl of 2 to 6 carbon atoms; straight or branched chain alkynyl of 2 to 6 carbon atoms; or unsubstituted or substituted phenyl or naphthyl which when substituted bears 1, 2 or 3 of the same or different substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halogen, azido, cyano, phenyl, nitro, trifluoromethyl, carbalkoxy of 1 to 4 carbon atoms in the alkoxy moiety and SO_n -alkyl of 1 to 4 carbon atoms in the alkyl moiety wherein n is 0, 1 or 2;

R^4 is straight or branched chain alkyl of 1 to 6 carbon atoms, straight or branched chain alkenyl of 2 to 6 carbon atoms, or straight or branched chain alkynyl of 2 to 6 carbon atoms; and

R^5 is straight or branched chain alkyl of 1 to 6 carbon atoms, straight or branched chain alkenyl of 2 to 6 carbon atoms, straight or branched chain alkynyl of 2 to 6 carbon atoms, or benzyl.

B 445,493

PREPARATION OF 4-(3-NITROPHENYL)PYRIDINE

Philip M. Carabateas, and Ruth Pauline Brundage, both of Schodack, N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Filed Feb. 25, 1974, Ser. No. 445,493

Int. Cl.² C07D *213/26*

U.S. Cl. 260—290 R **9 Claims**

References Cited

OTHER PUBLICATIONS

Bollinger, Azo & Diazo Chemistry Aliphatic and Aromatic Compounds, Title page & p. 168, (1961).

Cook et al., J. Chem. Society, (London), pp. 404–406, (1943).

1. The process which comprises reacting 4-(4-dimethylaminophenyl)pyridine with pyridine hydrochloride or hydrobromide at about 130°–260°C. to yield 4-(4-aminophenyl)pyridine, reacting said 4-aminophenyl compound with a lower-alkanoylating agent selected from lower-alkanoic anhydride or lower-alkanoyl halide the latter in the presence of alkali hydroxide, carbonate or bicarbonate to yield 4-[4-(lower-alkanoylamino)phenyl]pyridine, reacting the 4-(lower-alkanoylamino)phenyl derivative with concentrated nitric acid below 0°C. to yield 4-[4-(lower-alkanoylamino)-3-nitrophenyl]pyridine, reacting the 4-(lower-alkanoylamino)-3-nitrophenyl compound with aqueous alkali hydroxide solution at about 50°–150°C. to yield 4-(4-amino-3-nitrophenyl)pyridine, and removing the 4-amino group by diazotization of 4-(4-amino-3-nitrophenyl)pyridine as its mineral acid addition salt and reaction of the diazonium salt with a deaminating reducing agent selected from hypophosphorous acid, sodium borohydride and tetramethylurea to produce 4-(3-nitrophenyl)pyridine.

B 449,837

CHEMICAL PROCESS

Luke J. Governale, Baton Rouge, La., and John C. Wollensak, Bloomfield Hills, Mich., assignors to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 365,996, June 4, 1973, abandoned. This application Mar. 11, 1974, Ser. No. 449,837

Int. Cl.² C07E *87/28*

U.S. Cl. 260—578 **66 Claims**

References Cited

UNITED STATES PATENTS

2,814,646	11/1957	Kolka et al.	260/578 X
3,222,401	12/1965	Schmerling	260/578
3,230,257	1/1966	Schmerling	260/578 X
3,275,690	9/1966	Stroh et al.	260/578 X
3,649,693	3/1972	Napolitano	260/578
3,654,331	4/1972	Klopfer	260/578 X
3,733,365	5/1973	Yeakey et al.	260/578 X

1. In a process for alkylating an aromatic amine selectively in an ortho nuclear position, said aromatic amine having an unsubstituted ortho nuclear position and at least one hydrogen atom bonded to said amine nitrogen atom, said process comprising reacting said aromatic amine with an olefin at a temperature of about 200°–500°C. in the presence of an aluminum anilide catalyst, the improvement comprising adding a hydrogen halide selected from the group consisting of hydrogen chloride and hydrogen bromide to the alkylation mixture in an amount to provide up to two halogen atoms per aluminum atom in said mixture thereby increasing the rate of alkylation.

B 455,686

METHOD OF PRODUCING EPOXY GROUP-CONTAINING, QUATERNARY AMMONIUM SALT-CONTAINING RESINS

Joseph F. Bosso, Lower Burrell, and Marco Wismer, Gibsonia, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 277,697, Aug. 3, 1972, abandoned, which is a continuation-in-part of Ser. Nos. 158,063, June 29, 1971, abandoned, and Ser. No. 167,470, July 29, 1971, and Ser. No. 129,267, March 29, 1971, abandoned, and Ser. No. 100,825, Dec. 22, 1970, abandoned, and Ser. No. 100,834, Dec. 22, 1970, abandoned, said Ser. No. 158,063, is a division of Ser. No. 772,366, Oct. 31, 1968, abandoned, said Ser. No. 167,470, is a continuation-in-part of Ser. No. 840,847, July 10, 1969, abandoned, and Ser. No. 840,848, July 10, 1969, abandoned, and Ser. No. 100,825, and Ser. No. 100,834, said Ser. No. 100,825, and Ser. No. 100,834, each is a continuation-in-part of Ser. No. 56,730, July 20, 1970, abandoned, which is a continuation-in-part of Ser. No. 772,366, Oct. 31, 1968, abandoned. This application Mar. 28, 1974, Ser. No. 455,686

Int. Cl.[2] C08G *51/24*

U.S. Cl. 260—29.2 EP 14 Claims

References Cited

UNITED STATES PATENTS

2,676,166	4/1954	Webers	260/85.7
2,681,901	6/1954	Wiles et al.	260/47
3,257,347	6/1966	Woods et al.	260/29.2 EP
3,301,804	1/1967	Zora et al.	260/29.2

1. A method of preparing an ungelled, water-dispersible, epoxy group containing quaternary ammonium salt-containing resin comprising

A. reacting, at a temperature of about 70 to about 100°C. in the presence of about 1.75 to about 20 percent by weight based on total reaction mixture solids of water:

1. an organic polyepoxide having a 1,2-epoxide equivalent greater than 1, and
2. an amine acid salt, the weight ratio of said amine acid salt to said epoxy being from about one part to about 50 parts by weight of the salt per 100 parts by weight of epoxy; and,

B. adding to the resultant reaction product a material selected from the group consisting of aqueous boric acid solutions, boric acid, and compounds hydrolyzable to form boric acid in aqueous medium.

B 470,900

REPRESSION OF POLYMER FORMATION IN THE CONVERSION OF LINEAR OR BRANCHED PRIMARY DIAMINES TO CYCLIC IMINES

Arnold Hershman, St. Louis, Mo., and Anthony J. C. Pearson, Highton, Australia, assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 26,131, April 6, 1970, abandoned. This application May 17, 1974, Ser. No. 470,900

Int. Cl.[2] C07D *207/06*, *211/02*, *223/04*, *295/02*

U.S. Cl. 260—239 B 16 Claims

References Cited

UNITED STATES PATENTS

2,200,282	5/1940	Lazier	260/239 B
2,267,686	12/1941	Kyrides	260/268 SY
2,863,872	12/1958	Silverstone	260/326.8
2,952,688	9/1960	Kline et al.	260/313
3,268,588	8/1966	Horlenko	260/239 B

FOREIGN PATENTS OR APPLICATIONS

738,448	8/1943	Germany	260/239 B
892,034	3/1943	France	260/239 B

OTHER PUBLICATIONS

Yasumura, Chem. Abstracts, Vol. 59, Col. 2813 (1963).

1. Process for the conversion of linear or branched primary alkyl diamines to saturated cyclic secondary amines, the said diamines having a carbon chain of 3 to 7 carbon atoms between amine groups, with the repression of the formation of linear or branched secondary amines, tertiary amines and polymers, which comprises passing the said diamines in the vapor phase, in the absence of added ammonia, at a temperature of from 100°C to 250°C over a solid catalyst comprising an element selected from the group consisting of nickel, copper, cobalt or iron.

B 480,114

NOVEL QUATERNARY SALTS AND METHOD

Benedict R. Lucchesi, Ann Arbor, Mich., assignor to The Regents of the University of Michigan, Ann Arbor, Mich.

Continuation-in-part of Ser. No. 269,128, July 5, 1972, Pat. No. 3,840,666. This application June 17, 1974, Ser. No. 480,114

Claims priority, application United Kingdom, June 28, 1973, 30787/73

Int. Cl.[2] C07C *91/26*

U.S. Cl. 260—567.6 M 4 Claims

References Cited

UNITED STATES PATENTS

3,452,102	6/1969	Lednicer	260/567.6 M
3,658,815	4/1972	Fouche	260/567.6 M

OTHER PUBLICATIONS

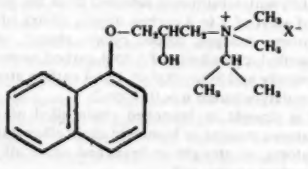
Lucchesi et al., Canadian Jour. Physical Pharm., Vol., 44, (1966), pp. 543–550.

Lucchesi et al., N.Y. Acad. of Sci., (1967), pp. 940–950.

Lucchesi et al., J. Pharm. and Exper. Therop., Vol. 162, pp. 49–55, (1968).

Lucchessi et al., Federation of American Society for Experimental Biology, Vol. 31, No. 2, p. 524, (Mar., 1972).

1. A compound of the formula



wherein X^- is the anion of a pharmaceutically acceptable non-toxic acid.

B 480,662

SYNTHESIS OF 2-METHYL-3-BUTEN-2-OL

Pius Anton Wehrli, North Caldwell, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 151,557, June 9, 1971, Pat. No. 3,838,183.
This application June 19, 1974, Ser. No. 480,662
Int. Cl.² C07C *29/24*
U.S. Cl. 260—643 R **5 Claims**

References Cited

UNITED STATES PATENTS

2,042,212	5/1936	Deanesly	260/643 D
2,072,015	2/1937	Tamele et al.	260/640
2,382,031	8/1945	Soday	260/643 D
3,308,173	3/1967	Emrick	260/643 D
3,737,467	6/1973	Fordham et al.	260/640

FOREIGN PATENTS OR APPLICATIONS

966,634	8/1964	United Kingdom	260/643 D
903,609	8/1962	United Kingdom	260/643 D

OTHER PUBLICATIONS

Horsley et al., "Azeotropic Data" (1952), pp, 7, 8 and 9.
Lange, *Handbook of Chemistry*, 10th ed., (1961), pp. 406, 407.
Monick, *Alcohols*, (1968), pp. 213, 214.

1. A method for making 2-methyl-3-buten-2-ol from the 2-halo and 4-halo addition products of a hydrohalide and isoprene, comprising:

providing an aqueous solution by adding a base, selected from the group consisting of calcium hydroxide, calcium carbonate, sodium bicarbonate, sodium carbonate and ammonium hydroxide; and water to said addition products, said base being added in an amount of from about 5% to about 35% by weight in excess of the amount required to hydrolyze said addition products such that a pH of at least 4 is provided; distilling said solution while maintaining said solution at a pH of at least 4 to produce an azeotropic water-immiscible 2-methyl-3-buten-2-ol mixture as the distillate; adding an alkali metal halide and an inert water-immiscible organic solvent to said distillate to form a two phase system containing an organic phase and an aqueous phase wherein the alkali metal halide is added to provide at least 50% of the amount necessary to saturate said aqueous phase, separating said aqueous phase from said organic phase and fractionally distilling said organic phase to recover 2-methyl-3-butene-2-ol while maintaining the organic phase at a pH of at least 4.

B 482,058

OCTAHYDRO AND DECAHYDRO DERIVATIVES OF ACID S, AN ANTIBIOTIC PRODUCED BY *POLYANGIUM CELLULOSUM* VAR. *FULVUM*

David T. Connor, Parsippany; Samuel M. Ringel, Rockaway; Sidney Roemer, Flanders, and Maximilian von Strandtmann, Rockaway Township, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed June 24, 1974, Ser. No. 482,058
Int. Cl.² A61K *35/00*
U.S. Cl. 424—122 **14 Claims**

References Cited

UNITED STATES PATENTS

3,651,216	3/1972	Ringel et al.	424/115
3,804,948	4/1974	Strandtmann et al.	424/122

1. An antimicrobial substance, octahydroacid S, prepared by treating octahydroacid S methyl ester (1 equivalent) with 5 percent aqueous sodium hydroxide solution (50 equivalents) for 30 minutes at 100° and having the following characteristics:

a. Molecular Formula $C_{28}H_{50}O_6$; molecular weight 482.

b. Infrared Spectrum ν_{max} 3350, 1720, 1460, 1380, 1080 and 720 cm^{-1}.

B 484,068

15α,16α-METHYLENE-4-ESTREN-17β-OLS

Rudolf Wiechert; Hermann Steinbeck, and Walter Elger, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Germany

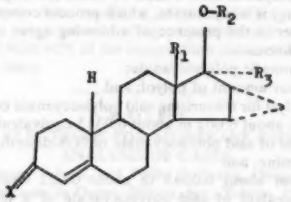
Continuation of Ser. No. 331,059, Feb. 9, 1973, abandoned.
This application June 28, 1974, Ser. No. 484,068
Claims priority, application Germany, Feb. 11, 1972, 2207421
Int. Cl.² C07J *1/00, 3/00*
U.S. Cl. 260—397.4 **25 Claims**

References Cited

UNITED STATES PATENTS

3,275,666	9/1966	Siegmann	260/397.4 X
3,469,008	9/1969	Schmidt et al.	424/243
3,470,160	9/1969	Schmidt et al.	260/239.55
3,525,757	8/1970	Schmidt et al.	260/397.4
3,749,742	7/1973	Wiechert et al.	260/397.4

1. 15α,16α-Methylene -4-estren-17β-ols of the formula



wherein R_1 is lower alkyl, R_2 is hydrogen or alkanoyl of 1-15 carbon atoms, R_3 is hydrogen or a monovalent lower aliphatic hydrocarbon of 1–5 carbon atoms unsubstituted or substituted by one of hydroxy or halogen, and X is oxygen or the group H,OR_4 wherein R_4 is hydrogen or alkanoyl of 1–15 carbon atoms.

B 486,678

CONTINUOUS MANUFACTURE OF PHTHALIMIDE

Eckhard Hetzel; Ludwig Vogel, both of Frankenthal; Gerhard Rotermund, Heidelberg, and Hans Christoph Horn, Lambsheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed July 8, 1974, Ser. No. 486,678
Int. Cl.² C07D *209/48;*
U.S. Cl. 260—326 R **7 Claims**

References Cited

UNITED STATES PATENTS

2,566,992	9/1951	Morgan et al.	260/326 R

FOREIGN PATENTS OR APPLICATIONS

300,770	8/1972	Austria	260/326 R

OTHER PUBLICATIONS

Pfeifer et al., "Chem. Abstracts," Vol. 77, p. 353, No. 126,087s (1972).

1. A process for the continuous manufacture of phthalimide which comprises reacting phthalic anhydride with ammonia at a temperature of from about 135°C. to 300°C., washing the off-gas with a melt of substantially pure phthalimide or a melt of crude phthalimide obtained as the end product from the reaction of phthalic anhydride with ammonia and containing at least 70% by weight of phthalimide, at a temperature of not less than 210°C, and then recycling the melt to the reaction.

B 486,828
CATALYST FOR SPRAYABLE POLYISOCYANURATE FOAM COMPOSITION

Robert J. Lockwood, East Haven, and Richard H. Roess, Clinton, both of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed July 9, 1974, Ser. No. 486,828
Int. Cl.² C08G *18/14, 18/18;* B32B *27/40*
U.S. Cl. 260—2.5 AW **8 Claims**

References Cited
UNITED STATES PATENTS

2,779,689	1/1957	Reis	260/2.5
3,487,080	12/1969	Matsui et al.	260/77.5 NC
3,745,133	7/1973	Communale et al.	260/2.5 AW
3,816,339	6/1974	Raden	260/2.5 AC
3,849,349	11/1974	Frisch et al.	260/2.5 AW
3,892,687	7/1975	Bechara et al.	260/2.5 AC

FOREIGN PATENTS OR APPLICATIONS

908,337	10/1962	United Kingdom	260/2.5 AW
1,155,768	6/1969	United Kingdom	260/2.5 AW

1. A process for the preparation of a composition capable of being sprayed to form a foam in which the major recurring polymer unit is isocyanurate, which process comprises bringing together in the presence of a blowing agent under spray foam conditions:
   a. an aromatic polyisocyanate;
   b. a minor amount of polyol; and
   c. a catalyst for trimerizing said polyisocyanate comprising:
      i from about 0.002 to about 0.0315 equivalent per equivalent of said polyisocyanate of N,N-dimethylcyclohexylamine; and
      ii. from about 0.0055 to about 0.022 equivalent per equivalent of said polyisocyanate of a tetra (lower-alkyl) ammonium lower alkanoic acid salt selected from the group consisting of tetramethylammonium acetate, tetraethylammonium acetate, tetramethylammonium propionate, tetramethylammonium octanoate, and tetramethylammonium 2-ethylhexanoate.

B 487,423
N-SUBSTITUTED 1-AMINO-3-PHENOXY-PROPAN-2-OL COMPOUNDS AND THERAPEUTIC COMPOSITIONS CONTAINING THEM

Fritz Wiedemann; Max Thiel, both of Mannheim; Kurt Stach, Mannheim-Waldhof; Karl Dietmann, Mannheim-Vogelstang, and Gisbert Sponer, Hemsbach, all of Germany, assignors to Boehringer Mannheim G.m.b.H., Mannheim, Germany

Filed July 10, 1974, Ser. No. 487,423
Claims priority, application Germany, Aug. 3, 1973, 2339396
Int. Cl.² C07D *228/38*
U.S. Cl. 260—239 D **7 Claims**

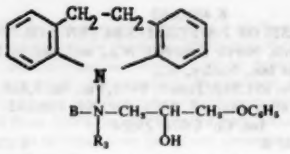
References Cited
UNITED STATES PATENTS

3,068,222	12/1962	Craig	260/239 D

OTHER PUBLICATIONS

Jacob et al., "Compt. Rend.," Vol. 252, (1961), pp. 2117 & 2118.

1. An N-substituted 1-amino-3-phenoxy-propan-2-ol of the formula



wherein
B is straight or branched chain alkylene or hydroxyalkylene of from 2 to 5 carbon atoms; and
R_3 is hydrogen or alkyl of up to 3 carbon atoms;
and the physiologically compatible acid addition salts thereof.

B 491,052
PHENOXYALKANE CARBOXYLIC ACID DERIVATIVE

Gunter Metz, Blaubeuren, and Manfred Specker, Ehingen, both of Germany, assignors to Ludwig Merckle KG, Blaubeuren, Germany

Filed July 23, 1974, Ser. No. 491,052
Int. Cl.² C07C *103/78*
U.S. Cl. 260—472 **1 Claim**

References Cited
UNITED STATES PATENTS

3,475,470	10/1969	Rebstock	260/472

1. 4-(p-chlorophenoxyacetylamino)-benzoic acid diethylaminoethyl ester p-chlorophenoxyisobutyrate.

B 492,716
APPARATUS FOR FILTRATION

Shinichiro Morimoto, Yokohama, and Osamu Abe, Kawaguchi, both of Japan, assignors to Kurita Water Industries Ltd., Osaka, Japan

Filed July 29, 1974, Ser. No. 492,716
Claims priority, application Japan, Aug. 2, 1973, 48-86345; Aug. 2, 1973, 48-86346
Int. Cl.² B01D *23/10*
U.S. Cl. 210—189 **3 Claims**

References Cited
UNITED STATES PATENTS

1,620,431	3/1927	Bramwell	210/189
1,861,295	5/1932	Bramwell	210/189
2,801,966	8/1957	Mertes et al.	210/189 X
3,272,335	9/1966	Nettel	210/189
3,550,774	12/1970	Hils	210/189
3,673,085	6/1972	Minart	210/189
3,767,048	10/1973	Prengemann	210/189
3,798,159	3/1974	Kisbocskol	210/189

1. An apparatus for filtration, which comprises in combination
   1 a filtration column consisting of
      1 a vertical cylinder,
      2 an inner cylindrical compartment disposed inside said vertical cylinder, erected so that the axis thereof falls in a vertical direction, provided in its side wall with a multiplicity of perforations for passage of liquid and possessed of an opening at the lower end
      3 an outer jacket compartment disposed so as to have said inner cylindrical compartment concentrically surrounded thereby, provided in the zone of its side wall corresponding to the perforated zone of said inner cylindrical compartment with a multiplicity of perforations for passage of liquid, constructed so that a part of the said vertical cylinder constitutes the outer wall thereof and possessed of an opening at the lower end,
      4 a filter bed having a granular filtering material constituting a filter bed packed in the space intervening

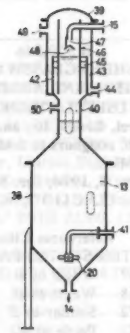
between said inner cylindrical compartment and the outer jacket compartment and

5 a means for delivering a liquid subjected to filtration and a means for discharging the filtered liquid, which means are connected to said inner cylindrical compartment and the outer jacket compartment so that the liquid will be passed in radial directions, either outwardly or inwardly, from one of said two compartments to the other,

2 a washing column consisting of,

1 a storage barrel having a large inner volume and provided with a means for projecting the washing water; and

2 a washing head connected to and located above the upper portion of said storage barrel and provided therein with (a) a cylindrical outer wall whose upper end is closed; (b) an outer cylinder coaxially disposed inside said outer wall and connected to said outer wall at its bottom for thereby forming an annular empty



portion closed at its bottom; (c) an inner cylinder coaxially disposed inside said outer cylinder and possessed of a greater height than said outer cylinder and open at both ends thereof; (d) a pipe for delivery of the liquid subjected to washing so disposed that the discharge end thereof opens at a level higher than the upper end of said outer cylinder; and (e) an outlet disposed at the lower portion of said outer wall for discharging the spent washing water overflowing said outer cylinder,

3 flow paths connecting the upper end and the lower end of said filtration column respectively to said washing column so as to permit conveyance of the granular filtering material between the columns and

4 a means adapted to cause the individual granules constituting said filter bed within said filtration column to be driven, while under simultaneous agitation, through the flow path into said washing column to be washed therein and convey the washed granules back to said filtration column in which they are packed to form a new filter bed.

B 493,950

VITAMIN COMPOSITIONS

Benjamin Borenstein, Teaneck, and Winifred Cort, Little Falls, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 188,586, Oct. 12, 1971, which is a continuation-in-part of Ser. No. 739,203, June 24, 1968, abandoned. This application Aug. 1, 1974, Ser. No. 493,950

Int. Cl.² A23L *1/30*

U.S. Cl. 426—73 **2 Claims**

References Cited

UNITED STATES PATENTS

2,444,215	6/1948	Whiteside et al.	426/73
2,980,587	4/1961	Ham et al.	426/73

1. A stable, vitamin A-enriched flour composition which comprises flour and a stable, free-flowing vitamin A composition in powdered form, said vitamin A composition comprising a spray-dried composition containing (a) from about 250,000 to about 500,000 International Units of vitamin A per gram, (b) from about 50 to about 120 mg. of an antioxidant per 1 million International Units of vitamin A and (c) from about 30% to about 65% by weight based on the total weight of the vitamin A composition, of an emulsifying agent, said vitamin A composition having a particle size distribution wherein at least 90% of the composition passes through a 100 mesh U.S. sieve.

B 511,002

GLASS ELECTRODE FOR MEMBRANE DIFFUSION ANALYSIS OF GASES

Barry Watson, Toledo, and Philip J. Breno, Oregon, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Oct. 1, 1974, Ser. No. 511,002

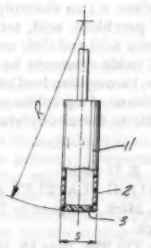
Int. Cl.² G01N *27/46, 27/36*

U.S. Cl. 204—195 P **2 Claims**

References Cited

UNITED STATES PATENTS

2,756,203	7/1956	Gilbert	204/195 G
3,188,285	6/1965	Watanabe et al.	204/195 G
3,278,408	10/1966	Leonard et al.	204/195 P
3,577,332	5/1971	Porter et al.	204/195 P
3,649,505	3/1972	Strickler et al.	204/195 P
3,718,567	2/1973	Haddad et al.	204/195 P
3,830,718	8/1974	Riseman et al.	204/195 P



1. In an electrochemical cell for potentiometrically analyzing gaseous specimens wherein said gaseous specimen permeates a thin, flexible, semipermeable membrane of microporous polypropylene and dissolves in an electrolyte to cause a measurable change in pH of said electrolyte, said cell comprising a glass electrode having a pH sensitive sensor tip, a reference electrode, a reservoir of liquid electrolyte, said sensor tip and said reference electrode being in electrical communication with each other through said reservoir of electrolyte, and said membrane being spaced from but positioned adjacent said sensor tip to confine a thin liquid film of said electrolyte without a spacer between said sensor tip and said membrane; the improvement wherein the outer surface of said sensor tip

has a convex curvature defined by a radius of curvature of between about 1 inch and about 2.5 inches, said sensor tip being attached to a chemically resistant glass tube having a diameter of about ⅛ inch at the point of attachment to define the height of the arc of said tip in the range of about 5 to about 15 mils whereby the thin film of liquid electrolyte confined between the sensor tip and the membrane is essentially of uniform thickness across the surface of said sensor tip.

B 511,665

LEAD BATTERIES

Fritz Beck, Ludwigshafen, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Germany

Continuation of Ser. No. 285,248, Aug. 31, 1972, abandoned. This application Oct. 3, 1974, Ser. No. 511,665

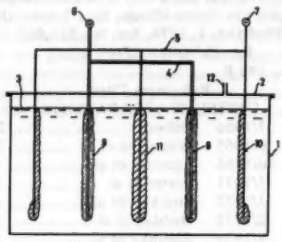
Int. Cl.² H01M 4/36

U.S. Cl. 136—26 **3 Claims**

References Cited

UNITED STATES PATENTS

1,425,163	8/1922	Bardt	136/26
2,737,541	3/1956	Coolidge	136/26 X
3,481,790	12/1969	Duddy	136/26 X
3,484,290	12/1969	Knight	136/10 X
3,486,940	12/1969	Ruben	136/26
3,576,674	4/1971	Ruben	136/26
3,615,831	10/1971	Ruben	136/26
3,629,007	12/1971	Kilduff	136/120 R X
3,870,563	3/1975	Ruben	136/26



1. A lead battery which can be alternately charged and discharged which comprises: a.) an electrolyte selected from the group consisting of perchloric acid, tetrafluoboric acid, fluosilicic acid and sulfamic acid and their corresponding lead salts; b.) a positive lead oxide electrode having a base plate made of titanium; and, c.) a negative lead electrode having a base plate made of graphite or of a graphite powder embedded in a binder which is stable to the electrolyte.

B 514,839

PROCESS FOR INHIBITING PLATELET AGGREGATION

Neel C. Sekhar, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 370,990, June 18, 1973, abandoned, which is a continuation-in-part of Ser. No. 276,714, July 3, 1972, abandoned. This application Oct. 15, 1974, Ser. No. 514,839

Int. Cl.² C12B 3/00, 9/00

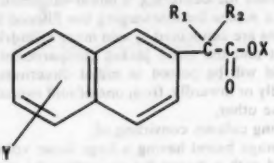
U.S. Cl. 195—1.8 **3 Claims**

References Cited

UNITED STATES PATENTS

3,663,584	5/1972	Alvarez	260/429.9
3,663,713	5/1972	Fried et al.	424/333
3,686,183	8/1972	Dysen	260/284
3,686,238	8/1972	Zaffaroni	260/399

1. A process for inhibiting platelet aggregation in vitro comprising the addition of an effective amount for inhibiting platelet aggregation of a compound of the formula:



wherein Y is lower alkyl of 1 to 8 carbon atoms, cyclopropyl, ethinyl, $-CF_3$, $-F$, $-Cl$, $-OCH_3$, $-OCHF_2$, $-OCH_2OCH_3$, $-SCH_3$, $-SCHF_2$, $-SCH_2OCH_3$, acetyl; R_1 and R_2 are H, CH_3, CHF_2, or taken together are $=CH_2$ or $=CF_2$; and X is hydrogen, or a pharmacologically acceptable cation, to whole blood or platelet-rich concentrates.

B 520,546

METHOD OF WASHING GLASSWARE AND INHIBITED CLEANING SOLUTION AND ADDITIVE COMPOSITION USEFUL THEREIN

Malachi E. Sorgenfrei, Grosse Ile, and Otto T. Aepli, Southgate, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Nov. 4, 1974, Ser. No. 520,546

Int. Cl.² C11D 7/06, 3/30

U.S. Cl. 252—156 **9 Claims**

References Cited

UNITED STATES PATENTS

2,419,805	4/1947	Wegst et al.	252/156
2,447,297	8/1948	Wegst et al.	252/135
3,705,856	12/1972	Sedliar et al	252/156
3,743,491	7/1973	Poole et al.	65/30 E

1. In a method of recycling returnable hot end coated glass containers wherein the glass containers are cycled a plurality of cycles over the normal useful life thereof, the glass containers in said cycles being filled with a product and thereafter emptied and the resultant soiled empty containers being returned for washing and refilling with a product, the said soiled returned glass containers being washed in said cycles in an alkaline aqueous solution of alkali metal hydroxide prior to refilling, the said hot end coated glass containers having a thin protective coating thereon including a coating of an organic hot end coating material applied to the glass containers while hot, the resultant hot end coating initially being substantially free of objectionable color and imparting abrasion resistance to the glass containers, the initial hot end coating being altered by the repeated washings in said cycles in the said aqueous solution of alkali metal hydroxide whereby the glass containers exhibit loss of abrasion resistance or an objectionable discoloration appears, the improvement in combination therewith which consists essentially of prolonging the useful life of the said protective hot end coating including the said coating of the organic hot end coating material by washing the said soiled hot end coated glass containers in an inhibited aqueous caustic soda cleaning solution consisting essentially of on a weight basis from 0.3 to 6.0 percent of caustic soda, from 0.01 to 0.3 percent of a soluble zinc containing compound when calculated as zinc oxide, and the remainder water.

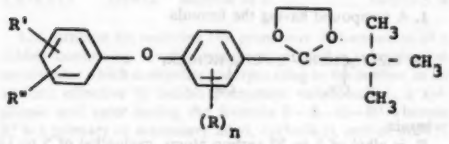
B 521,643
SUBSTITUTED 2-(4-PHENOXYPHENYL)-2-TERTIARY BUTYL-1,3-DIOXALANES

Faizulla G. Kathawala, West Orange, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed Nov. 7, 1974, Ser. No. 521,643
Int. Cl.² C07D 317/22
U.S. Cl. 260—340.9 4 Claims

References Cited
FOREIGN PATENTS OR APPLICATIONS
1,080,536 4/1960 Germany

1. A compound of the formula:



wherein

R is hydrogen, alkyl of 1 to 4 carbon atoms, or halo of atomic weight of from 18 to 36,

R′ and R″ are independently hydrogen, halo of atomic weight of from 18 to 36, alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms, and

n is 1 or 2.

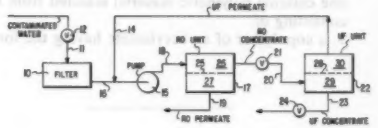
B 524,806
METHOD AND APPARATUS FOR PURIFYING AQUEOUS STREAMS CONTAMINATED WITH ORGANIC MATERIALS

Kamal K. Ladha, Riverview; William M. Herring, Trenton, and Joseph F. Louvar, Lincoln Park, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Nov. 18, 1974, Ser. No. 524,806
Int. Cl.² B01D 31/00, 13/00
U.S. Cl. 210—23 H 47 Claims

References Cited
UNITED STATES PATENTS

3,228,876	1/1966	Mahon	210/22
3,617,550	11/1971	Elata et al.	210/321 X
3,836,457	9/1974	Gross et al.	210/321 X
3,839,201	10/1974	Miller	210/500 M X



1. Apparatus for separating an aqueous medium contaminated with minor amounts of organic materials into an aqueous fraction relatively concentrated with respect to the organic contaminants and a water fraction relatively free of organic contaminants comprising

a reverse osmosis unit including a high pressure compartment and a low pressure compartment separated by a reverse osmosis membrane,

an ultrafiltration unit including a high pressure compartment and a low pressure compartment separated by an ultrafiltration membrane,

the high pressure compartment of the reverse osmosis unit being adapted to operate at a substantially higher pressure than the high pressure compartment of the ultrafiltration unit,

first conduit means including fluid pressure reducing means for withdrawing a concentrate fraction under a relatively high pressure from the high pressure compartment of the reverse osmosis unit and introducing it into the high pressure compartment of the ultrafiltration unit under a relatively low pressure,

second conduit means including fluid pressure increasing means for withdrawing a permeate fraction from the low pressure compartment of the ultrafiltration unit under a relatively low pressure and introducing it into the high pressure compartment of the reverse osmosis unit under a relatively high pressure,

the said high pressure compartment of the reverse osmosis unit, the said first conduit means, the said high pressure compartment of the ultrafiltration unit, the said low pressure compartment of the ultrafiltration unit, and the said second conduit means comprising a circuit for substantially continuously recirculating liquid and at least a portion of the contaminated aqueous medium being recirculated therein,

a source of aqueous medium contaminated with minor amounts of organic contaminants to be separated into an aqueous fraction which is relatively concentrated with respect to the organic contaminants and a water fraction which is relatively free of the organic contaminants, the said aqueous medium including organic contaminants having molecular weights of less than 10,000 which are soluble therein initially but have a limited solubility range and are precipitated therefrom upon concentration of the contaminated aqueous medium in the high pressure compartment of the reverse osmosis unit,

means including third conduit means for withdrawing contaminated aqueous medium from the said source and introducing it at a substantial rate of flow into the said circuit for recirculating liquid,

the high pressure compartment of the reverse osmosis unit being adapted to operate at a pressure in excess of the osmotic pressure of the aqueous medium and at a sufficiently elevated pressure to produce a permeate fraction which passes through the reverse osmosis membrane into the said low pressure compartment and a concentrate fraction in the said high pressure compartment which contains the said organic contaminants in sufficiently high concentration to cause precipitation of at least a portion of the organic contaminants therefrom,

the high pressure compartment of the ultrafiltration unit being adapted to operate at a pressure less than 200 pounds per square inch and at a sufficiently elevated pressure to produce a permeate fraction which passes through the ultrafiltration membrane into the said low pressure compartment

means including fourth conduit means for withdrawing a permeate fraction which is relatively free of organic contaminants from the low pressure compartment of the reverse osmosis unit, and

means including fifth conduit means for withdrawing a concentrate fraction which is relatively concentrated with respect to the organic contaminants from the high pressure compartment of the ultrafiltration unit.

B 530,580
ANHYDROUS PRODUCTS HAVING IMPROVED WETTABILITY CHARACTERISTICS

James J. Keegan, Bloomfield; Girish Patel, Mine Hill, and Howard Rubin, Rockaway, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 302,162, Oct. 30, 1972, Pat. No. 3,878,138. This application Dec. 9, 1974, Ser. No. 530,580
Int. Cl.² C08L 5/06, 5/04
U.S. Cl. 260—17.4 ST 4 Claims

References Cited
UNITED STATES PATENTS

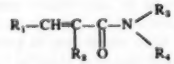
2,997,399	8/1961	Eberhard et al.	106/35
3,427,191	2/1969	Howell et al.	117/138.8
3,440,065	4/1969	La Via	106/35
3,509,113	4/1970	Monagle et al.	260/79.3
3,511,791	5/1970	Puetzer et al.	260/17.4
3,833,518	9/1974	Rubin et al.	260/17 R

OTHER PUBLICATIONS
Kanner et al., *Chemical Abstracts*, 67: 12,857f (1967).
Bailey, et al., *Chemical Abstracts*, 70: 79,407g (1969).

1. A denture adhesive powder having superior wettability characteristics comprises a substantially anhydrous mixture of nontoxic, adhesive ingredients and from about 40% to about 60% by weight, based on the total weight of the denture adhesive ingredients of a powdered polymeric material having an average particle size of less than about 422 microns, said polymeric material being selected from the group consisting of powdered polyethylene having an average molecular weight ranging from about 1000 to about 3500 and powdered polypropylene having an average molecular weight ranging from about 120,000 to about 350,000, said denture adhesive ingredients comprising:

A. from about 5% to about 55% by weight, based on the total weight of the denture adhesive ingredients of at least one cationic polymeric material selected from the group consisting of

1. a copolymer of an acrylamide having the formula:



(I)

wherein R_1 is methyl or hydrogen; and R_2, R_3, and R_4 are each hydrogen or 1 to 7 carbon lower alkyl, with a vinyl quaternary ammonium salt selected from the group consisting of trialkylaminoalkyl acrylate salts, trialkylaminoalkyl methacrylate salts, and vinyloxyalkyltrialkylammonium salts, wherein the alkyl group contains from 1 to 7 carbon atoms; and

2. a copolymer of an acrylamide having the formula (I) above with a vinyl or alkyl-substituted vinyl pyridinum salt, wherein the alkyl group is 1 to 7 carbon lower alkyl; and

B. from about 5% to about 55% by weight, based on the total weight of the denture adhesive, of at least one anionic gum selected from the group consisting of gum karaya, gum arabic, gum Shiraz, gum tragacanth, pectin, pectinates, algin and alginates.

B 532,140
HINDERED HYDROXYPHENYLALKANOATES OF SUBSTITUTED ISOPROPANOLS

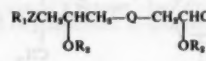
Martin Dexter, Briarcliff Manor, and David Herbert Steinberg, Bronx, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 12, 1974, Ser. No. 532,140
Int. Cl.² C07C 149/20, 69/76
U.S. Cl. 260—473 S 4 Claims

References Cited
FOREIGN PATENTS OR APPLICATIONS

1,436,393	1966	France	260/473
288,839	1967	Australia	260/473
2,133,374	1/1972	Germany	260/473

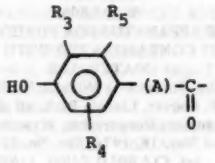
1. A compound having the formula



wherein

R_1 is alkyl of 1 to 30 carbon atoms, cycloalkyl of 5 to 12 carbon atoms, alkylthioethyl of 4 to 27 atoms in the chain or alkylpolyoxyalkylene of 4 to 27 atoms in the chain having the general structure $R^{\circ}(OC_nH_{2n})_h$ or $R^{\circ}(OCH_2CHR')_h$ where R° is alkyl of 1 to 18 carbon atoms, n is 2 to 4, R' is hydrogen, methyl or ethyl and h is 1 to 3,

R_2 is the group



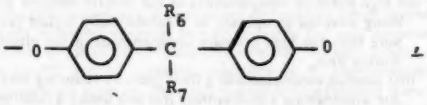
R_3 is hydrogen, alkyl of 1 to 8 carbon atoms, cycloalkyl of 5 to 6 carbon atoms or α-methylbenzyl,

R_4 is alkyl of 1 to 8 carbon atoms or cycloalkyl of 5 to 6 carbon atoms,

R_5 is hydrogen or lower alkyl of 1 to 4 carbon atoms or R_3 and R_5 together are a butylene chain which, together with the phenyl ring, form a tetrahydronaphthyl group, and provided when R_3 is hydrogen, R_5 is alkyl and R_4 is located on the carbon atom ortho to the hydroxyl group,

A is a covalent carbon bond or a straight or branched lower alkylene having 1 to 8 carbon atoms,

Q is the group



R_6 is hydrogen or alkyl of 1 to 4 carbon atoms,

R_7 is hydrogen or alkyl of 1 to 8 carbon atoms, and

Z is oxygen or sulfur.

B 546,149

VULCANISATION PROCESS

Stanley Ashton; Peter Laithwaite, and John Anthony Taylor, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Jan. 31, 1975, Ser. No. 546,149

Claims priority, application United Kingdom, May 22, 1974, 22844/74

Int. Cl.² C08K *5/41*

U.S. Cl. 260—79.5 P 9 Claims

References Cited

UNITED STATES PATENTS

3,546,185	12/1970	Coran et al.	260/79.5 B
3,640,976	2/1972	Boustany	260/79.5 B
3,678,017	7/1972	Shelton et al.	260/79.5 B

1. A process for reducing the premature vulcanisation of a rubber containing a vulcanisation agent and a vulcanisation accelerator which comprises incorporating in the rubber, in an amount effective to inhibit premature vulcanisation, a sulphenic acid ester having the formula R—S—O—R^1 wherein R^1 is a primary or secondary alkyl, cycloalkyl, aryl or aralkyl group any of which may be substituted by at least one substituent selected from the group consisting of halogen, cyano, hydroxy, nitro, alkoxy, aryloxy, aryloxycarbonyl, alkoxycarbonyl, alkyl sulphonyl and —OS.R^2 where R^2 is alkyl or alkoxy either of which may be substituted by chlorine or alkoxy, and R is any of the groups defined for R^1 or a tertiary alkyl group which may be substituted by any of the substituents given in connection with R^1.

B 559,142

LONG-WEARING PLASTIC BEARINGS

Eugene H. Hussey, Temple, Pa., assignor to The Polymer Corporation, Reading, Pa.

Filed Mar. 17, 1975, Ser. No. 559,142

Int. Cl.² C10M *5/00, 7/00*

U.S. Cl. 252—12 4 Claims

References Cited

UNITED STATES PATENTS

3,852,203	12/1974	Morisaki	252/12
3,896,036	7/1975	Cairns	252/12

1. A plastic bearing material adapted to be used in sliding contact with metal comprised of a minor amount of a polymeric polyolefin material having a low exchange time, minor amount of a relatively chemically inert fluorinated hydrocarbon polymeric material that is capable of replacing or supplementing the low exchange time material at the metal surface, and a comparatively tough, rigid material selected from the group consisting of nylon, polyesters, polycarbonates, polyacetals, and polysulfones that will act as a carrier and retainer for the polymeric material having the relatively high chemical inertness.

B 564,252

PROCESS FOR PRODUCTION OF γ-HALONITRILES

James H. Plonka, and Ralph A. Davis, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 2, 1975, Ser. No. 564,252

Int. Cl.² C07C *120/04*

U.S. Cl. 260—465.7 14 Claims

References Cited

UNITED STATES PATENTS

2,415,261	2/1947	Rogers	260/465.7 X
2,800,497	7/1957	Indest	260/465.7
3,725,458	4/1973	Starks	260/465.3 X
3,839,399	10/1974	Starks et al.	260/465.1 X

OTHER PUBLICATIONS

Starks, J.A.C.S., 93, 1971, pp. 195–199.

Allen, Organic Synthesis, Coll. Vol. I, 2nd ed., 1941, pp. 156–157.

Starks, J.A.C.S., 95, 1973, pp. 3613–3617.

Rappoport, "The Chemistry of the Cyano Group," 1970, pp. 77–79, Interscience Publishers.

1. A process for the preparation of γ-halonitriles comprising reacting by contacting a 1,3-dihalopropane wherein the halogens are chlorine, bromine, or iodine, with an alkali metal cyanide in the presence of at least 0.3 moles of an alkali metal halide wherein the halide is chlorine, bromine, or iodine, per mole of the 1,3-dihalopropane, sufficient water to dissolve the inorganic salts, and a catalytic amount of an onium salt selected from the group consisting of a quaternary ammonium salt, a quaternary phosphonium salt, and a tertiary sulfonium salt.

B 566,585

PROCESS FOR PRODUCING ISOAMYLASE

Robert Otto Horwath, Westport, and Philip Rotheim, Stamford, both of Conn., assignors to Standard Brands Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 395,501, Sept. 10, 1973, abandoned. This application Apr. 8, 1975, Ser. No. 566,585

Int. Cl.² C12D *13/10*

U.S. Cl. 195—65 10 Claims

References Cited

UNITED STATES PATENTS

3,622,460	5/1968	Masuda et al.	195/66 R
3,790,446	2/1974	Smith	195/66 R
3,806,419	4/1974	Heady	195/66 R

1. A process for producing isoamylase comprising propagating microorganisms which produce isoamylase in an aqueous nutrient medium having present an amount of maltitol sufficient to increase the amount of isoamylase produced over the amount of isoamylase produced by propagating the microorganisms without the presence of maltitol.

B 592,146

PROCESS FOR PRODUCING ISOAMYLASE

Robert Otto Horwath, Westport, Conn.; Gary William Cole, Garland, Tex., and John Anthony Lally, Stamford, Conn., assignors to Standard Brands Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 413,121, Nov. 5, 1973, abandoned. This application July 1, 1975, Ser. No. 592,146
Claims priority, application Canada, Oct. 31, 1974, 212750
Int. Cl.[2] C12D *13/10*
U.S. Cl. 195—65 9 Claims

References Cited
UNITED STATES PATENTS

3,490,995	1/1970	Wallenfels et al.	195/66 R
3,560,345	2/1971	Yokobayashi et al.	195/66 R
3,622,460	11/1971	Masuda et al.	195/66 R
3,790,446	2/1974	Gunja-Smith	195/66 R
3,806,419	4/1974	Heady	195/66 R

FOREIGN PATENTS OR APPLICATIONS

852,196	9/1970	Canada

OTHER PUBLICATIONS

Mitchell et al., J. App. Bact. Vol. 32 pp. 40–50 (1969).
Manners et al., Biochem J. Vol. 135 pp. 11–18 (1973).

1. A process for producing isoamylase, comprising propagating Flavobacterium sp. ATCC 21918 under aerobic conditions in an aqueous nutrient medium having present a suitable carbon source.

B 426,227
METHOD AND APPARATUS FOR ELECTRICAL DISCHARGE MACHINING

Nagao Saito, Nagoya; Kazuhiko Kobayashi, Seto, and Toshiro Oizumi, Nagoya, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 19, 1973, Ser. No. 426,227

Claims priority, application Japan, Dec. 19, 1972, 47-127498

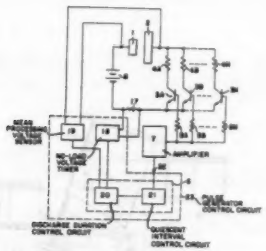
Int. Cl.[2] B23P *1/08*

U.S. Cl. 219—69 M — 5 Claims

References Cited

UNITED STATES PATENTS

3,590,317	6/1971	Sennowitz	219/69 C
3,614,368	10/1971	Lobun	219/69 C
3,697,719	10/1972	Vernen	219/69 C
3,705,287	12/1972	Saito et al.	219/69 P
3,755,645	8/1973	Kauffman	219/69 C



1. A method of shaping a workpiece by electrical discharge, comprising the steps of:

intermittently impressing a voltage pulse across a working gap formed between a workpiece and an electrode to generate a discharge during a discharge period;

detecting the no-load period between the instant at which the voltage pulse is impressed across the working gap and the instant at which a discharge occurs between the workpiece and the electrode;

detecting the average processing voltage across the working gap; and

varying the discharge period in accordance with the detected no-load period and in accordance with the detected average processing voltage to cause the discharge period to vary directly as the no-load period and to vary inversely as the average processing voltage after the average processing voltage reaches a predetermined level.

2. Apparatus for shaping a workpiece by electrical discharge comprising:

means for intermittently impressing a voltage pulse across a working gap formed between a workpiece and an electrode to generate a discharge during a discharge period;

means for detecting the no-load period between the instant at which the voltage pulse is impressed across the working gap and the instant at which a discharge occurs between the workpiece and the electrode;

means for detecting the average processing voltage across the working gap; and

means for varying the discharge period in accordance with the detected no-load period and in accordance with the detected average processing voltage to cause the discharge period to vary directly as the no-load period and to vary inversely as the average processing voltage after the average processing voltage reaches a predetermined level.

B 428,408
DATA PROCESSING ARRANGEMENT FOR PRINTERS

Maurice J. Ouellette, Waynesboro, Va., assignor to General Electric Company, Waynesboro, Va.

Division of Ser. No. 428,366, Dec. 26, 1973, abandoned. This application Dec. 26, 1973, Ser. No. 428,408

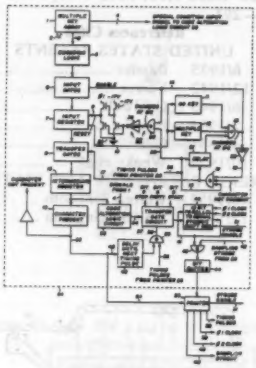
Int. Cl.[2] G06F *3/02*, *11/00*; G08B *29/00*

U.S. Cl. 340—146.1 AB — 19 Claims

References Cited

UNITED STATES PATENTS

3,493,928	2/1970	Juliusburger	340/146.1 AB
3,675,239	7/1972	Ackerman et al.	340/365 E
3,683,370	8/1972	Nagano et al.	340/365 E
3,716,850	2/1973	Fisher et al.	340/365 E
3,717,871	2/1973	Hatano et al.	340/365 E
3,740,745	6/1973	Chao	340/365 E
3,750,160	7/1973	Elzinga	340/365 E
3,792,466	2/1974	Arnold et al.	340/365 E



1. In a printer for executing functions represented by signals, a source of recurrent system timing pulses, a plurality of symbol keys on a keyboard, first, second and third signal storage registers,

means for manually depressing said keys to produce respective key pulses of substantially brief duration which are independent of the duration of time that any particulaar key remains depressed,

means for converting said key pulses to respective binary coded signals representing the symbol associated with the operated key,

first gates for applying said converted binary coded signals to a first register,

means for analyzing the binary coded signals in said first register to detect signals representing the absence of a no key or the absence of a multiple key depression,

means responsive to said detected signals to block said first gates until two system timing pulses have occurred following a key depression,

second gates responsive to the first timing pulse occurring after key depression and to the second register being empty of signals for transferring binary coded signals from said first to said second register,

means responsive to the second timing pulse following key depression for clearing the first register and unblocking said first gates,

means responsive to said second register having signals stored therein and said second timing pulse for transfer-

ring binary coded signals from the second to the third register and clearing the second register after said last named transfer,

means for converting the signals in said third register from parallel to serial form,

means for transferring said third register signals in serial form to said printer for execution of the represented functions by said printer,

means responsive to transfer of said third register signals to said printer for clearing said third register,

means for analyzing the signals in said first register to detect signals representing a no key or a multiple key operation,

and means responsive to said last named detected signals to unblock said first gates.

B 451,248

MOISTURE CONTROL DEVICE FOR STEAM TURBINES

Neville K. Patel, Secane, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 14, 1974, Ser. No. 451,248

Int. Cl.² H05B *1/00;* **F01D** *5/08;* **F04D** *29/58*

U.S. Cl. 219—201 **6 Claims**

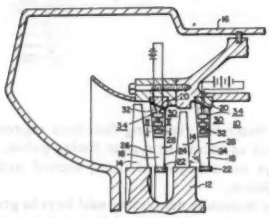
References Cited

UNITED STATES PATENTS

2,004,777	6/1935	Bassler	415/178 UX
2,304,259	12/1942	Karrer	416/95
2,377,611	6/1945	Caldwell	415/178 UX
2,540,472	2/1951	Boyd	219/201
2,547,934	4/1951	Gill	415/121 R
2,690,890	10/1954	Weeks et al.	219/202 X

FOREIGN PATENTS OR APPLICATIONS

681,186	10/1952	United Kingdom	415/121 R
805,352	12/1958	United Kingdom	219/201



1. An axial flow, elastic fluid turbine apparatus comprising:

a rotor;

an annular array of circumferentially spaced rotatable blades fastened to said rotor for rotation therewith;

a casing encircling said array of rotatable blades and said rotor;

an annular array of circumferentially spaced stationary nozzle blades fastened to said casing, said annular array of stationary nozzle blades adapted to direct elastic fluid against said array of rotatable blades;

an outer covering disposed over a predetermined portion of at least one of said stationary nozzle blades;

a thermal insulating member disposed between said one of said stationary nozzle blades and said outer covering; and

electrical means for raising the temperature of said outer covering to the Leidenfrost point to prevent the deposition of moisture droplets entrained within an elastic fluid flow on said outer covering to inhibit the agglomeration thereof into larger moisture drops to prevent erosion of said rotatable blades within said annular array of rotatable blades.

B 458,964

ROTARY AIR BEARING HEAD WITH LEADING EDGE CONTROLLING AIR BEARING

George N. Nelson, Milpitas; Frank E. Talke, Los Gatos, and Raymond C. Tseng, San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 8, 1974, Ser. No. 458,964

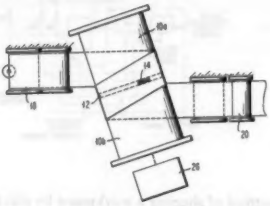
Int. Cl.² G11B *5/60, 21/20, 15/64*

U.S. Cl. 360—102 **12 Claims**

References Cited

UNITED STATES PATENTS

3,404,241	10/1968	Streets et al.	360/102
3,416,148	12/1968	Berghaus et al.	360/102
3,504,136	3/1970	Maxey	360/102
3,510,604	5/1970	Kell	360/102
3,512,145	5/1970	Gabor	360/102
3,614,338	10/1971	Emmasingel	360/102
3,725,606	4/1973	Thompson	179/100.2
3,821,813	6/1974	Freeman et al.	360/102



1. A rotary magnetic head assembly for use in a rotary head magnetic tape recorder of the self acting air bearing type, which recorder includes a cylindrical tape mandrel with two sections defining a gap,

said rotary magnetic head assembly comprising:

a rotary drum for coaxial disposition within the gap of such a mandrel;

a magnetic head attached to said drum, said head including a right sided base portion and a doubly convex crown portion, symmetrical about an axial plane of said drum, whose curvatures are of the same order as that of said rotary drum and which has a transducing gap therein, said crown portion being substantially coterminous with said base portion so as to provide an air bearing surface for said head;

said head further including a leading edge region between said base and crown portions, said leading edge region being configured to be relatively flatter and of substantially smaller area than said crown portion and with an angle of attack intermediate those of the adjacent crown and base portions, said leading edge region and crown portion projecting entirely beyond the periphery of said mandrel, whereby upon rotation of said drum an air bearing is provided for a tape of a uniform thickness between 5 and 100 microinches over substantially the whole length of said crown portion.

B 470,899

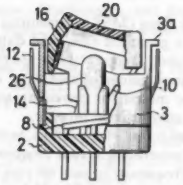
SWITCH WITH ROCKER ACTUATOR HAVING DETACHABLE COVER

Shigeo Ohashi, c/o Nihon Kaiheiki Kogyo Kabushiki Kaisha, 5-14 Minamimagome 1-chome, Oto, Tokyo, Japan

Filed May 17, 1974, Ser. No. 470,899
Claims priority, application Japan, July 9, 1973, 48-80524
Int. Cl.² H01H 9/18
U.S. Cl. 200—309 1 Claim

References Cited
UNITED STATES PATENTS

3,154,661	10/1964	Bierenfeld	200/309
3,160,731	12/1964	Gemmell	200/309
3,435,169	3/1969	Bienwald	200/315
3,598,950	8/1971	Ohashi	200/315
3,601,566	8/1971	Hansen et al.	200/314



1. In an illuminated miniature switch including a base formed of an insulating material, a casing consisting of sidewalls extending upwardly from and fixed to the upper part of said base, lamp means within said casing, and a convertor member pivotally supported in said casing and having a rocking motion, corresponding to the rocking motion of a cup shaped operating button, said operating button being formed of a synthetic resin material, possessing some elasticity and including means at one end for detachably attaching one end of said operating button to said pivotally supported convertor the improvement which comprises:

providing an opening in the upper face of said operating button, said opening being defined by a peripheral ledge extending around the periphery of said opening from inwardly inclined walls defining a lower portion of said opening and at least one recess in the lower portion of at least one of said walls; and

providing a cover adapted to be detachably received in said opening and supported on said walls said cover including a projection extending outwardly from said cover and in a direction generally in a plane parallel to the plane of the cover and adapted to be received in the recess in said inclined sidewall of said operating button and to secure said detachable cover in said opening.

B 480,740

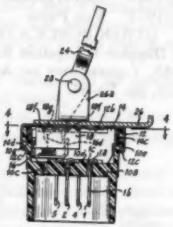
MULTIPLE CIRCUIT SLIDE SELECTOR SWITCH HAVING FIXED CONTACT RETAINING BAND

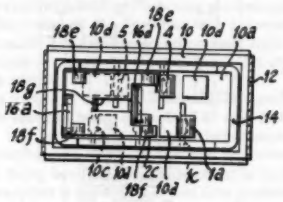
Harry W. Brown, Big Bend, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed June 19, 1974, Ser. No. 480,740
Int. Cl.² H01H 15/04
U.S. Cl. 200—16 C 10 Claims

References Cited
UNITED STATES PATENTS

2,981,897	4/1961	Beggs	339/210 R X
3,029,320	4/1962	Laete	200/16 C
3,192,352	6/1965	Piber	200/314
3,223,794	12/1965	Hoy et al.	200/243 X
3,329,778	7/1967	Bedocs	200/16 C
3,330,930	7/1967	Hill et al.	200/243
3,504,140	3/1970	Atkinson	200/16 C
3,549,832	12/1970	Ferryman, Jr.	200/61.54 X
3,602,656	8/1971	Graddy et al.	200/16 C X
3,604,863	9/1971	Schink	200/16 C
3,691,323	9/1972	Anderson et al.	200/166 X





1. A multiple circuit selector switch having a plurality of operating positions for energizing corresponding electric circuits comprising:

a switch housing including an insulating base and a cover forming a compartment for the switch contacts and a plurality of slots in the bottom of said base, each said slot having a through-portions extending all the way through the bottom of said base and a partial-portion extending partway down into the bottom of said base near an adjacent wall of said base;

a plurality of formed, one-piece stationary contact-terminals in said slots having terminals extending out through said through-portions in the bottom of said base and having wings in said partial-portions of the slots extending toward adjacent walls of said base and having stationary contacts within said compartment;

an insulating retainer lining walls of said compartment, being held down by said cover and having lower portion over said wings for retaining said stationary contact-terminals fixed in their slots;

a contact actuator block reciprocally movable in said compartment;

a spring-biased movable bridging contact carried by said actuator block for engaging said stationary contacts selectively;

operating means for actuating said actuator block;

and mounting means on said housing for mounting said switch to a support.

B 497,702

MONOPULSE RADAR SYSTEM

Maurice Earl Breese, Moorestown, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 317,719, Dec. 22, 1972, abandoned. This application Aug. 15, 1974, Ser. No. 497,702

Int. Cl.² G01S 9/48, 9/22

U.S. Cl. 343—8 **4 Claims**

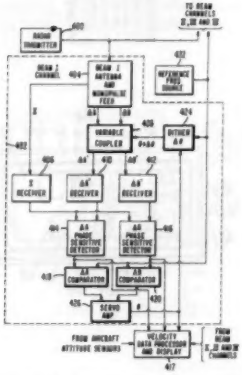
References Cited

UNITED STATES PATENTS

2,911,644	11/1959	Stavis	343/8
3,102,263	8/1963	Meyer	343/8
3,235,865	2/1966	Flower et al.	343/8
3,423,752	1/1969	Schwartz	343/8
3,430,236	2/1969	Gamertsfelder	343/8 X
3,708,794	1/1973	Van Popta	343/16 M X

OTHER PUBLICATIONS

"Null Tracking Doppler–Navigation Radar" by P. G. Smith, IEEE, Mar. 1963, Transactions on Aerospace and Navigational Electronics, pp. 50–64.



2. In a doppler radar system aboard an aircraft of the type employing at least three non-coplanar beam antennas directed towards the ground for receiving return signals from the ground in response to transmitted radar signals and means responsive to said return signals for determining the velocity components of said aircraft with respect to the ground; the improvement wherein said antennas are fixedly mounted, non-track stabilized monopulse antennas having given respective axes with respect to said aircraft, each monopulse antenna simultaneously picking up a respective signal from each member of a set of discrete spaced beam components disposed substantially symmetrically about that antenna's axis, and wherein said system includes axis-rotating means for each of said antennas responsive to said signals picked-up by that antenna which without any mechanical movement of said fixedly mounted, non-track stabilized monopulse antennas in effect rotates its set about its axis to maintain substantially constant at a predetermined value the angular orientation of its set with respect to an isodop on the ground.

B 498,775

MINIMUM SHIFT KEYING COMMUNICATION SYSTEM

Joseph Francis Balcewicz, Hightstown, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 19, 1974, Ser. No. 498,775

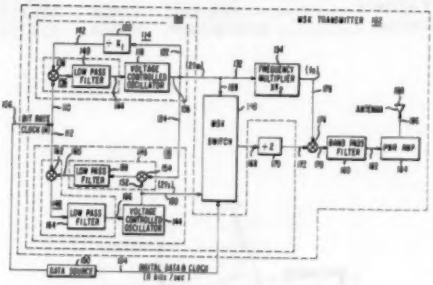
Int. Cl.² H04L 27/10

U.S. Cl. 178—66 R **14 Claims**

References Cited

UNITED STATES PATENTS

2,977,417	3/1961	Doelz et al.	178/66 R
3,146,307	8/1964	Renshaw	325/320
3,484,693	12/1969	Fong	325/30
3,674,934	7/1972	Gooding et al.	178/88
3,731,233	5/1973	Hutchinson	178/66 R
3,743,775	7/1973	Hutchinson et al.	178/66 R



1. A minimum shift keying (MSK) transmitter for communicating binary data at a given bit rate, said data being represented by first and second frequency signals respectively indicative of predetermined values of said data, comprising:

a. input data source means for providing said data and a clock signal indicative of said bit rate;

b. a first phase locked loop (PLL) means, responsive to said clock signal, for generating a first frequency signal, the ratio of said first frequency to said bit rate being a predetermined ratio of integers, said first PLL means including a frequency divider for maintaining said predetermined ratio of integers;

c. a second phase locked loop means, responsive to said clock signal and said first frequency signal, for generating said second frequency signal such that the frequency difference between said first frequency signal and said second frequency signal is one half the bit rate of said data; and

d. means, responsive to said data and said first and second frequency signals, for transmitting either said first frequency signal or said second frequency signal in accordance with said data.

B 501,503

SINGLE TRIGGER PHOTOGRAPHIC STROBE UNIT

Conrad H. Biber, Needham, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 320,447, Jan. 2, 1973, abandoned. This application Aug. 29, 1974, Ser. No. 501,503

Int. Cl.² H05B 41/29

U.S. Cl. 315—241 P **15 Claims**

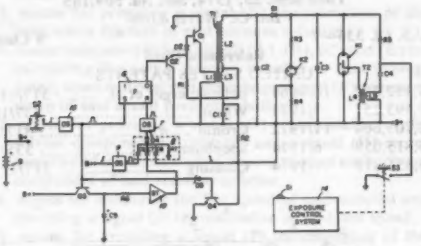
References Cited

UNITED STATES PATENTS

3,569,779	3/1971	Luursema	315/183
3,644,818	2/1972	Paget	321/18
3,758,822	9/1973	Wilwerding	315/241 P
3,764,849	10/1973	Ohta	315/241 P

14. An electronic flash operating system comprising a storage capacitor, charge control means settable to a first state and a second state for supplying charging current to

said capacitor in said first state, manually operable means for setting said charge control means to said first state, and



means responsive to the discharge of said capacitor for setting said charge control means to said second state.

B 502,161

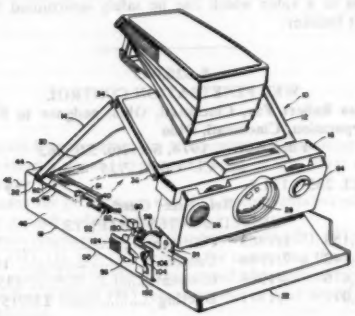
FILM CASSETTE LOADING DOOR LATCH AND INTERLOCK SWITCH FOR PHOTOGRAPHIC APPARATUS

Andrew S. Ivester, Charlestown, and James J. Marchese, Saugus, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Aug. 30, 1974, Ser. No. 502,161
Int. Cl.² G03B *17/52, 17/00*
U.S. Cl. 354—174 **9 Claims**

References Cited
UNITED STATES PATENTS

3,643,567	2/1972	Douglas	354/187
3,750,551	8/1973	Land et al.	354/83 R
3,760,701	9/1973	Paglia	354/83 X



1. Photographic apparatus for use with a cassette of the type including a plurality of sheet members which include an opaque light seal and a plurality of photosensitive film units that are adapted to be sequentially exposed and processed, said apparatus comprising:

a first housing member defining a chamber configured to receive the cassette;

access means in said first housing member defining an opening therein through which the cassette may be inserted or removed;

sequence control means for providing sequencing commands to a drive means, said control means being powered by an electrical energy source;

a second housing member movably connected to said first housing member for movement between a first open position unblocking said access means to said chamber thereby permitting a cassette to be inserted into or removed from said chamber and a second closed position which blocks said access means and thereby secures a cassette disposed within said chamber, said second housing member further including thereon a pair of rotatably mounted juxtaposed rollers adapted to receive and advance therebetween a film unit brought into operative relationship therewith by a drive means and a gear mounted on at least one of said rollers for imparting rotatory motion thereto, said gear adapted to be coupled with the drive means when said second housing member is in its second closed position;

means for pivotally connecting said second housing member to said first housing member so as to permit the movement of said second housing member between its first open position and its second closed position;

drive means for removing one of the sheet members from the cassette, said drive means being actuable in response to commands from said sequence control means and powered by the electrical energy source, said drive means further including:

an electric motor energizable on command from said sequence control means;

gear means coupled to said electric motor for driving said gear on one of said rollers when brought into engagement therewith; and

means powered by said electric motor for selectively engaging individual ones of the sheet members of the cassette to advance such sheet member from the cassette into operative relationship with said pair of rollers so that such sheet member is received between said rollers;

exposure means for selectively exposing photosensitive ones of the film units of the cassette, said exposure means being actuable in response to commands from said sequence control means upon completion of a conductive path by a switch;

latch means including first and second latch members, said first latch member being connected to said first housing member, said second latch member being connected to said second housing member, said first and second latch members being brought into engagement as said second housing member is moved from said first position to said second position, said latch means securing said second housing member to said first housing member in locked relationship when said second housing member reaches said second position, said first latch member including a tab rigidly attached to said first housing member and adapted to engage said second latch member, and wherein said second latch member is a multicam surfaced member pivotally mounted to said second housing member for relative rotatory motion with respect thereto;

means for disengaging said first and said second latch member from said locked relationship thereby permitting relative movement between said first and said second housing members, said disengaging means being mounted for movement between a first inoperative position to a second unlatching position such that whenever said second housing member is in its second closed position said disengaging means is in its first inoperative position; and

a circuit for providing a conductive path from the electrical energy source to said sequence control means and said drive means, said conductive path being selectively interruptable by a switch coupled intermediate the electrical energy source and in energy supplying relationship with said sequence control means and said drive means, said circuit including a switch having at least two conductive members, one of said conductive members being movable

in correspondence with the movement of said second housing member towards a predetermined point of contact with the other conductive member to complete said conductive circuit path from the electrical energy source to said sequence control means and said drive means, said predetermined point of contact being closely proximate with said second housing member being in its second position so as to provide an interlock function for said photographic apparatus.

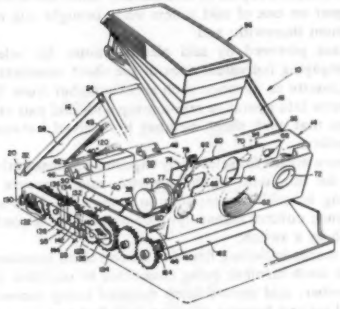
B 507,131
GALVANO-MAGNETIC EFFECT CONTROL SYSTEM FOR PHOTOGRAPHIC APPARATUS

Christian C. Petersen, Westwood, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Sept. 18, 1974, Ser. No. 507,131
Int. Cl.² G03B *19/12*; H03K *3/00*
U.S. Cl. 354—156 **17 Claims**

References Cited
UNITED STATES PATENTS

3,610,968	10/1971	Yamada	307/278 X
3,744,385	7/1973	Burgarella et al.	354/23 D



1. Photographic apparatus comprising:
means actuable to sequentially perform a first function and a second function in the course of producing a photographic record;
means for actuating said function performing means to perform said first function, said actuating means including electrically energizable means for establishing a magnetic field and a displaceable member operably associated with said magnetic field to be displaced from one position to another position responsive to an energization of said electrically energizable means, said member serving to establish a path for said magnetic field having a reluctance which varies as said member moves from its said one position towards its said other position;
means for selectively coupling said electrically energizable means to a source of electrical energy;
galvano-magnetic effect means, operably positioned with respect to said magnetic field, for producing an output signal responsive to said magnetic field achieving a predetermined characteristic determined by both the energization condition of said electrically energizable means and the reluctance of said variable reluctance path; and
means responsive to said output signal for actuating said function performing means to perform said second function.

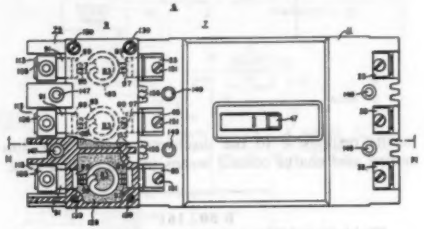
B 509,165
CIRCUIT INTERRUPTER INCLUDING A CURRENT-LIMITING REACTOR

James C. Wilson, Beaver, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 25, 1974, Ser. No. 509,165
Int. Cl.² H01H *83/00*
U.S. Cl. 335—7 **8 Claims**

References Cited
UNITED STATES PATENTS

3,152,282	10/1964	Baltensperger et al.	317/11 C
3,593,251	7/1971	Wilson	337/186
3,703,664	11/1972	Cronin	317/20
3,815,059	6/1974	Spoelman	335/16
3,836,819	9/1974	Clausing	317/11 C



1. A circuit interrupter having a peak let-through current under sudden severe overcurrent conditions, comprising a circuit breaker having separable contacts, and current-limiting reactor means connected in series circuit relationship with said circuit breaker; said current-limiting reactor means comprising an insulating housing having a compartment formed therein, a coil of conductive material supported within said housing and electrically connected in series circuit relationship with contacts of said circuit breaker, and electrically insulating thermally conducting filler material surrounding said coil and occupying the volume of said compartment; said current-limiting reactor means being connected to said circuit breaker during both normal and overcurrent conditions and limiting the peak let-through current during overcurrent conditions to a value which can be safely interrupted by said circuit breaker.

B 520,063
WEB PENETRATION CONTROL

Charles Robert Fay, Cincinnati, Ohio, assignor to Formica Corporation, Cincinnati, Ohio

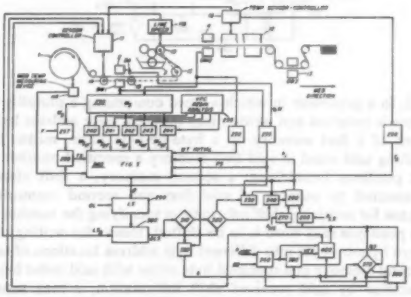
Filed Nov. 1, 1974, Ser. No. 520,063
Int. Cl.² G06G *7/58*
U.S. Cl. 235—151.1 **19 Claims**

References Cited
UNITED STATES PATENTS

3,073,153	1/1963	Petitjean	73/73
3,260,642	7/1966	Canter, Jr.	162/252
3,378,676	4/1968	Clement	235/151.3
3,596,071	7/1971	Doering	235/151.35 X

11. In a fibrous host material treating process wherein said material is impregnated by a resinous solution in a treater and dried in a dryer, apparatus for controlling the penetration of the resin into said host material comprising
1. first gauge means adjacent to said material for measuring the weight of said material before impregnation and providing a signal (A) representative of said weight,
2. second gauge means mounted before said dryer and adjacent to said material for measuring the impregnated, undried weight of said material and providing a signal (B) representative of said weight of said impregnated, undried material,

3. third gauge means mounted after said dryer and adjacent to said material for measuring the dried weight of said impregnated material and providing a signal (C) representative of said weight of said dried material,
4. means for providing a signal (D) representative of the initial temperature of said host material,
5. means for providing a signal (E) representative of the resin solids fraction of said resinous solution,
6. means responsive to said signals (A), (B), (C) and (E) for calculating the actual percent volatiles of said impregnated, dried material and providing a signal (F) representative of said actual percent volatiles,
7. means for providing a signal (G) representative of the solvent component percentages and a signal (H) representative of the latent heat of vaporization of each solvent component of said resinous solution,
8. means for measuring the line speed of said material and providing a signal (I) representative of said line speed,
9. means for providing a signal (J) representative of the dryer length,



10. means for measuring the temperature of said dryer and providing a signal (K) representative of said dryer temperature,
11. means for providing a signal (L) representative of the heat capacity of the host material,
12. means responsive to said signals (A), (B), (D), (E), (F), (G), (H), (I), (J), (K) and (L) for computing the actual film coefficient of the impregnated, dried material and providing a signal (M) representative of said actual film coefficient,
13. means responsive to said signal (M) for computing whether said signal (M) is at a variance or in compliance with a signal (N) representative of a predetermined film coefficient and providing a signal (O) representative of the conformity or non-conformity of said signal (M) and said signal (N),
14. means responsive to said signal (O) for computing the penetration change required to substantially equalize said signal (M) and said signal (N) and providing a signal (Q) representative of said required penetration change and
15. means responsive to said signal (Q) for controlling the penetration of said resin into said host material.

B 520,076

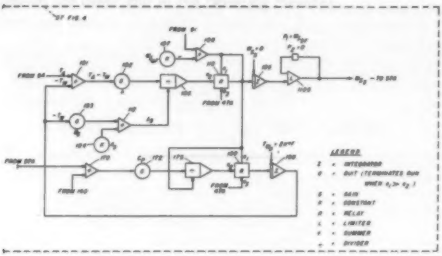
METHOD AND APPARATUS FOR THE FEED FORWARD CONTROL OF A MATERIAL TREATER

Charles Robert Fay, Cincinnati, Ohio; Alfred Thomas Guertin, Somerville, and John William Stinson, Wayne, both of N.J., assignors to Formica Corporation, Cincinnati, Ohio

Filed Nov. 1, 1974, Ser. No. 520,076
Int. Cl.² G06G 7/58
U.S. Cl. 235—151.1 **10 Claims**

References Cited
UNITED STATES PATENTS

3,073,153	1/1963	Petitjean	73/73
3,260,642	7/1966	Canter, Jr.	162/252
3,378,676	4/1968	Clement	235/151.3
3,596,071	7/1971	Doering	235/151.35 X



6. In a fibrous host material treating process wherein said material is treated with a resinous solution in an applicator and dried in a dryer, apparatus for controlling the resin application to said material and the drying of the treated material comprising
1. gauge means adjacent to said material and before said applicator so as to measure a series of left side portion and right side portion weights of said host material before treatment and provide a signal (A) representative of said left side weights and a signal (B) representative of said right side weights,
2. means responsive to said signals (A) and (B) for calculating the average weight of said host material before treatment and providing a signal (C) representative of said average weight,
3. means responsive to said signal (C) for calculating the desired weight of said host material after treatment and before drying and providing a signal (D) representative of said desired weight,
4. means for measuring the line speed of said host material and providing a signal (E) representative of said line speed,
5. means responsive to said signal (D) and said signal (E) for calculating the required roll speed of said applicator treating said host material and providing a signal (F) representative of said required roll speed,
6. means responsive to said signal (F) for controlling the roll speed of the applicator treating said host material,
7. means for measuring the average temperature of the dryer and providing a signal (G) representative of said average dryer temperature,
8. means responsive to said signal (C) and said signal (G) for calculating the line speed set point and providing a signal (H) representative of said line speed set point,
9. means responsive to said signal (H) for controlling the line speed of said host material,
10. second means responsive to said signal (A) and said signal (B) for calculating the difference between said left side and said right side weights and providing a signal (I) representative of said difference,
11. means responsive to said signal (I) for calculating the roll gap change of said applicator required to enable

uniform application of resinous solution and providing a signal (J) representative of said roll gap change,

12. means responsive to said signal (J) for determining the left roll gap set point of said applicator and providing a signal (K) representative of said left roll gap set point,

13. means responsive to said signal (K) for controlling the left gap of said applicator,

14. second means responsive to said signal (J) for determining the right roll gap set point of said applicator and providing a signal (L) representative of said right roll gap set point, and

15. means responsive to said signal (L) for controlling the right roll gap of said applicator.

B 530,255

PROCESS FOR INHIBITING PLATELET AGGREGATION

Neel C. Sekhar, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 370,033, June 18, 1973, abandoned, which is a continuation-in-part of Ser. No. 276,698, July 31, 1972, abandoned. This application Dec. 6, 1974, Ser. No. 530,255

Int. Cl.² C12B *3/00*

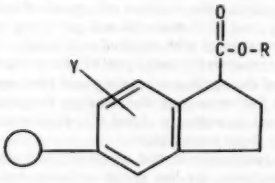
U.S. Cl. 195—1.8 **3 Claims**

References Cited

UNITED STATES PATENTS

3,644,479	2/1972	Judy et al.	424/317
3,663,627	5/1972	Judy et al.	260/618 F

1. A process for inhibiting platelet aggregation in vitro comprising the addition of a compound of the formula:



wherein ◯ is phenyl; Y is hydrogen, halogen, $-CF_3$, —OH, lower alkyl of 1 to 8 carbon atoms, lower alkoxy of 1 to 8 carbon atoms, $-NH_2$, —SH, or -S-lower alkyl of 1 to 8 carbon atoms; and R is hydrogen, or a pharmacologically acceptable cation, to whole blood or platelet-rich concentrates wherein the amount of the compound added is from about 0.1 to 50 micrograms per milliliter.

B 533,454

SHIFT AND ROTATE CIRCUIT FOR A DATA PROCESSOR

John Christian Moran, Broomfield, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 16, 1974, Ser. No. 533,454

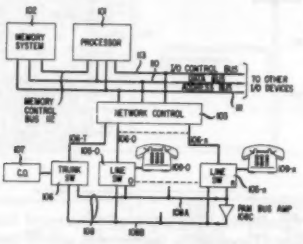
Int. Cl.² G06F *7/00*, *13/00*; G11C *19/00*

U.S. Cl. 340—172.5 **22 Claims**

References Cited

UNITED STATES PATENTS

3,228,005	1/1966	Delmege et al.	340/172.5
3,270,324	8/1966	Meade et al.	340/172.5
3,475,730	10/1969	Figueroa et al.	340/172.5
3,500,466	3/1970	Carleton	340/172.5
3,516,069	6/1970	Bray et al.	340/172.5
3,778,778	12/1973	Ragen	346/172.5
3,781,812	12/1973	Wymore et al.	340/172.5
3,820,079	6/1974	Bergh et al.	340/172.5



1. In a processor in which a word comprising a plurality of bytes is received and written into different byte address locations of a first memory on a byte-by-byte basis, means for shifting said word in said first memory a specified number of bit positions comprising: a second memory, a shift circuit connected to outputs of said first and second memories, means for receiving shift information specifying the number of bit positions said word is to be shifted, means for writing said word byte-by-byte into different byte address locations of said second memory in a specified byte order with said order being specified by said received shift information, means subsequently effective for concurrently reading the bytes of said word in both of said memories consecutively, means for applying to said shift circuit data bits comprising each concurrently read byte from said first and second memories, and means including said shift circuit controlled by said shift information and responsive to said concurrently received data bits from said memories for forming a new plural byte word representing said received word shifted said specified number of bit positions.

B 574,616

DRIVE MECHANISM FOR AN X-RAY ANTI-SCATTER GRID

Serge Rouge, Montrouge (Hauts-de-Seine), and Richard Dumesnil, Carrieres-sur-Seine, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 5, 1975, Ser. No. 574,616

Claims priority, application France, May 8, 1974, 74.15879

Int. Cl.² H01J *35/16*

U.S. Cl. 250—445 T **2 Claims**

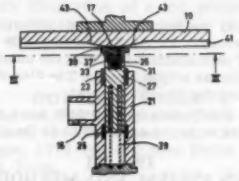
References Cited

UNITED STATES PATENTS

2,720,596	10/1955	Acker	250/445 T
3,684,885	8/1972	Cook	250/509
3,770,955	11/1973	Tomita	250/445 T

1. A drive mechanism for the anti-scatter grid of an X-ray apparatus, comprising a driven parallelogram-like supporting

arm construction which is pivotable in all directions about a pivot, an X-ray source being connected on one side of the pivot, on the other side of the pivot there being provided an image section comprising the said anti-scatter grid and a drive disc which is coupled to the anti-scatter grid and which is provided with a diametrically extending groove which cooperates with a drive pin, the said drive pin being connected to the supporting arm construction on the side of the pivot which is remote from the X-ray source and being slidable under spring pressure with respect to the supporting arm construction in a direction perpendicular to the plane of the disc, characterized in that the diametrical groove comprises an inclined portion which serves as a run-out for the drive pin and which has a maximum height which is substantially equal to the maximum depth of the diametrical groove, the drive pin being arranged in a resetting member which cooperates with the disc under friction and which bears on the one side against the disc under spring pressure and which on the other side is slidable in the lateral direction with respect to the disc under the force of two



reset springs which are connected on the one end to the disc and on the other end to the resetting member.

DEFENSIVE PUBLICATIONS

PUBLISHED MARCH 2, 1976

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T944,001
AUTOMATED SYSTEM AND METHOD FOR PARTITIONING AND MAPPING CIRCUIT UNITS ONTO MODULES INCLUDING AN ITERATIVE PROCESS

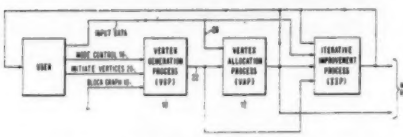
Maurice Hanan, Ossining, and Peter Karl Wolff, Sr., Shrub Oak, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of application Ser. No. 479,069, June 13, 1974. This application Sept. 23, 1974, Ser. No. 508,471

Int. Cl. G06f *9/12*

U.S. Cl. 444—1

10 Sheets Drawing. 11 Pages Specification



An iterative process, embodied as a computer algorithm, is provided for partitioning and mapping logic circuits onto chips. The process can be advantageously used in the field of design automation for large scale integrated circuit technology. The process begins with a given partition, or partial partition, wherein not all circuits have been allocated. A set of circuits is removed from one or more chips and the set of circuits is re-allocated. The process is specified by two rules, the rule for removing the circuits and the rule for re-allocating the circuits, and two versions of the removal rule, the multiple method and the single method are described. By employing the process of the present invention, the number of blocks (i.e., circuit units) on a module (chip) may be reduced, the number of connection pins over all the modules and maximum number of pins on any modules may be reduced, and the number of modules may be reduced.

T944,002
END-OF-PATH INSERTION SYSTEM

Luther Jay Woodrum, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

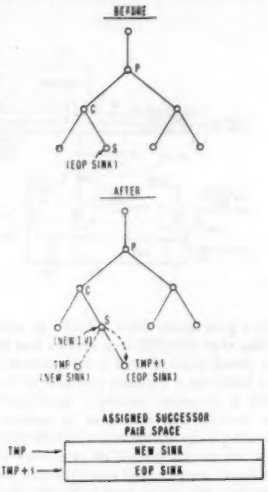
Continuation of application Ser. No. 415,085, Nov. 12, 1973, which is a continuation of abandoned application Ser. No. 203,573, Dec. 1, 1971. This application Sept. 30, 1974, Ser. No. 510,811

Int. Cl. G06f *13/00, 13/06*

U.S. Cl. 444—1

12 Sheets Drawing. 41 Pages Specification

Electronically generating and inserting each entry always at the end of a path in a binary tree directory. Each new insertion entry directly displaces an existing sink found by a search of the directory with a search argument (which may be an input key). The input sequence of search arguments may be unsorted. The ascending (descending) path property is not used in a directory constructed with this invention. As a result, there is no sorted relationship among the sinks contained within this directory as occurs, on the other hand, when generating or inserting into directories constructed with the inventions using the ascending path property in prior related applications having Ser. Nos. 136,902 and 136,951 filed Apr. 23, 1971, by the same inventor as the subject application. The end-of-path insertion location is found using the search method invention in prior application Ser. No. 136,686 filed Apr. 23, 1971 by the same inventor. The inner vertices in this directory may contain edges having the absolute, offset, or invertible form.



T944,003
METHOD AND APPARATUS FOR MEASURING THE DISTANCE TO DISCONTINUITIES IN A SIGNAL TRANSMITTING MEDIUM

Richard John Roberts, 77 Stewart Clark Ave., South Queensferry, Scotland, and Michael Crabtree, 46 Oatlands Park, Linlithgow, Scotland

Filed Oct. 9, 1974, Ser. No. 513,426

Claims priority, application Great Britain, Nov. 9, 1973, 52,057/73

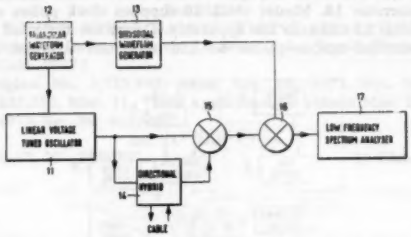
Int. Cl. G01S *9/24*

U.S. Cl. 343—14

2 Sheets Drawing. 6 Pages Specification

A method for measuring the distance to a discontinuity in a signal transmitting medium such as a cable is disclosed employing a swept frequency reflectometer. A swept frequency signal is transmitted into said medium, and the signal reflected by the discontinuity is received. An intermediate frequency obtained by mixing (in **15**) the transmitted and the received signals is proportional to the distance to the discontinuity. Means (**13** and **16**) are provided for amplitude modulating the intermediate

frequency signal at twice the frequency sweep repetition rate and, preferably, with 100% modulation. The modulation signal is phase locked to the frequency sweep repetition rate so that the modulation signal is at a



minimum at the extreme points of the sweep. Thereby unwanted sidebands of the intermediate frequency are suppressed to improve the resolution of the reflectance measurement.

T944,004

DEVICE TO IMPROVE THE REVERSE LEAKAGE CHARACTERISTICS IN METAL SEMICONDUCTOR CONTACTS

Carl Altman, Lagrangeville, Sydney G. Chapman, Poughkeepsie, and Akella V. S. Satya, Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of abandoned application Ser. No. 244,157, Apr. 14, 1972. This application Oct. 21, 1974, Ser. No. 516,548.

Int. Cl. H01l *29/48, 29/56*
U.S. Cl. 357—15
2 Sheets Drawing. 14 Pages Specification

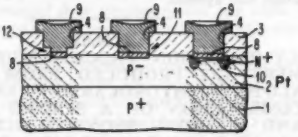


FIG. 1A is illustrative current voltage curves comparing diodes produced in accordance with the prior art methods showing the conventional "soft knee" reverse bias characteristics of metal semiconductor diodes on P type substrates. FIG. 1B has the same characteristics of metal P type semiconductor diodes produced in accordance with this invention. Referring to the non-guard ring structure shown centrally in FIGS. 2, 3, and 4, typically a P-type substrate **1** is provided with an epitaxial layer **2** of two to three microns thick, upon which an oxide or insulating layer **3** is grown in the magnitude of 3000 A thickness. The oxide layer is selectively etched utilizing photoresist and etchant to open an area through to the semiconductor material. This is known in the art as a diffusion or metallization window. These openings are illustrated at **4** in the above-mentioned figures. These etched or otherwise provided contact areas are subjected to low energy ionic bombardment utilizing illustrative apparatus shown in FIG. **6** wherein a wafer or substrate **5** is supported at **6** in an evacuated chamber **7** wherein a plasma state of an inert atmosphere such as argon is supported between an RF electrode **13** and an annular ground plate **14**. The wafer is subjected to ion bombardment from the said plasma by means of a negative DC bias on the wafer **5**. The bombardment treatment is followed by metal deposition utilizing an electron beam gun or any other suitable mechanism. The metal is deposited into the hole **4** to produce a metal semiconductor contact at **8**. FIGS. 2, 3, and 4 illustrate the metal semiconductor contact devices using magnesium, aluminum and platinum as the contact metals. Interconnection metallurgy, for example, aluminum if different from the said contact metal is deposited at **9** to complete the device formation. FIG. 5 is a schematic illustration of a test procedure apparatus used to determine the current voltage characteristics illustrated in FIGS. 1A and 1B.

T944,005

HOT MELT ADHESIVE

Richard J. Brewer, 920 Springbrook Drive 37663; Ralph A. Chambers, 904 Clearwood Ave. 37660 and Brice S. Wininger, 1015 Wood Edens Drive 37660, all of Kingsport, Tenn.

Continuation of abandoned application Ser. No. 401,492, Sept. 27, 1973. This application Nov. 19, 1974, Ser. No. 525,256

Int. Cl. C08l *1/10*
U.S. Cl. 106—180
No Drawing. 10 Pages Specification

Hot melt adhesive composition comprising a cellulose ester, a plasticizer ester and a dicarboxylic acid or anhydride, especially useful on kraft paper or corrugated paperboard which is to be repulped.

T944,006

MAGNESIUM BASE DIE CASTING ALLOY

Sidney L. Couling, Columbus, Ohio, assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 5, 1974, Ser. No. 529,885

Int. Cl. C22c *23/02*
U.S. Cl. 75—168 B
No Drawing. 4 Pages Specification

A magnesium base alloy suitable for use in high pressure die casting containing by weight from about 0.2 to about 3 percent aluminum, greater than 1.5 up to about 2 percent silicon and optionally up to about 2 percent manganese and up to about 1 percent zinc. The die cast article has improved corrosion and creep resistance over similar, low silicon content, die casting alloys of the prior art.

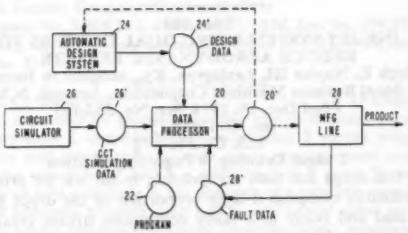
T944,007

TESTING SYSTEMS AND PROCESSES FOR MANUFACTURING COMPLEX ARTICLES

Robert Middleton Booth, Jr., Wappingers Falls, N.Y., Robert Runyan Elam, Manassas, Va., Larry Wooley Holmstrom, Poughkeepsie, N.Y., Keith Wesley Lallier, Reston, Va., Lawrence Kenneth Lange, Wappingers Falls, N.Y., Chung Up Lee, Manassas, Va., Eugen Igor Muehldorf, Potomac, Md., and Prem Puri, Fairfax, William Rosenbluth, Reston, and Anil D. Savkar, Annandale, Va., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of abandoned application Ser. No. 391,891, Aug. 27, 1973. This application Dec. 9, 1974, Ser. No. 531,008

Int. Cl. G06f *15/46*
U.S. Cl. 444—1
34 Sheets Drawing. 77 Pages Specification



In a data processing system, a complex article, e.g. an integrated circuit may be identified by the system as an economically acceptable article after partial or less than

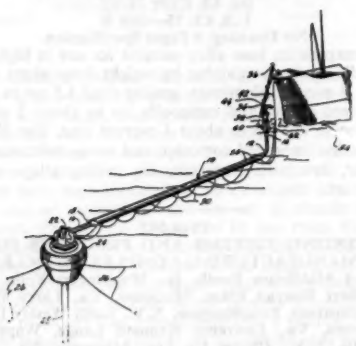
one hundred percent testing by the steps of: (a) storing topological data or geometry of each physical element for embodying a logical net in an integrated circuit; (b) storing test simulation results of each logical state in the logical nets embodied in the integrated circuit; (c) identifying fault sensitive geometry in all logical elements and nets that perform and interact in achieving a design function for the integrated circuit; (d) identifying geometry for the logical elements and net for which no test simulation could be determined; (e) tabulating the sensitive areas of untested geometries; (f) calculating fault occurrence rates for the sensitive geometries; (g) adjusting the fault occurrence rates for the sensitive geometries for (1) production experience and (2) clustered distribution of faults instead of uniform distribution of faults, and (h) projecting (1) the yield of tested articles and (2) the quantity of defective articles shipped when full or one hundred percent testing is not applied to the articles.

T944,008

SINGLE POINT MOORING SYSTEM FOR USE IN ARCTIC WATERS

Joseph F. Schirtzinger, Pasadena, Calif., assignor to Sea-Log Corporation, Pasadena, Calif.

Filed Dec. 16, 1974, Ser. No. 532,841
Int. Cl. B63b *35/12*
U.S. Cl. 9—8 P
2 Sheets Drawing. 11 Pages Specification



A floating rigid tubular boom is anchored at one end to a submerged tank or buoy. The other end of the boom is adapted to be connected to a tanker for transferring oil from the tanker to a submerged tank or on-shore facility. The submerged end of the boom is anchored below the normal depth of ice occurring in the surrounding waters. An ice-cutting arrangement **60** on the boom keeps the boom free of ice where it passes upwardly above the surface of the water.

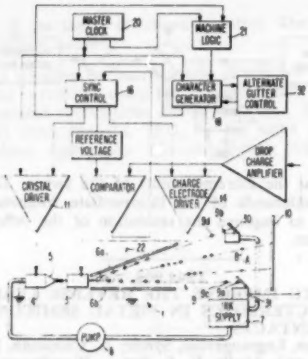
T944,009

INK JET SYSTEM USING DUAL GUTTERS TO REDUCE AERODYNAMIC EFFECTS

Hugh E. Naylor III, Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 19, 1974, Ser. No. 534,403
Int. Cl. G01d *15/18*
U.S. Cl. 346—75
1 Sheet Drawing. 4 Pages Specification

Ink drops not used for printing in an ink jet printer ordinarily comprise a large proportion of the drops generated and occur in a fairly continuous stream creating distortion due to wake effects. Such effects are minimized by directing the unused drops alternately to each of two gutters **30** or **31**. Since there are only half as many drops in each of these streams, the wake is considerably reduced, perhaps by 50% "wake" in each stream. Nozzle assembly **1** includes crystal **4** vibrated by crystal driver **11** to form and propel drops from nozzle **5**. Drops are variably charged by charge electrode **3** controlled by driver **14**, sync control box **16** and character generator **18**. Master clock **20** supplies clock pulses and block **21** controls the apparatus. Drops are deflected by potential across plates **6*a*** and **6*b*** from terminal **22**.



Drops not required for printing such as drops **9*a***, **9*c*** and **9*b***, **9*d*** are directed on an alternate basis to gutters **30** and **31** respectively under control of alternate gutter control block **32**. Drops required for printing along lines A and B, for example, are directed along various paths to document **10**. Drops landing in gutters **30**, **31** are returned to ink supply **7** for recirculation by pump **8** through the system.

T944,010

POLYMERIZATION PROCESS WHEREIN POLYMERS ARE PRODUCED FROM SATURATED ALIPHATIC HYDROCARBONS EMPLOYING A COMBINATION OF A STRONG LEWIS ACID AND A STRONG BRONSTED ACID

Durward T. Roberts, Jr., and Joseph A. Beckman, Akron, Lawrence E. Calihan, Cuyahoga Falls, and Adel F. Halasa, Bath, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation of application Ser. No. 368,563, June 11, 1973, which is a continuation-in-part of application Ser. No. 191,814, Oct. 22, 1971, both now abandoned. This application Dec. 24, 1974, Ser. No. 536,121
Int. Cl. C07c *9/00, 11/00*
U.S. Cl. 260—676 R
No Drawing. 15 Pages Specification

Polymers, including dimers, trimers, oligomers and higher polymers are produced from saturated aliphatic hydrocarbon monomer of from 1 to 20 carbon atoms. The monomer is contacted with a mixture of a strong Lewis acid and a strong Bronsted acid at a temperature of from —80° to 120° C. The combination of a strong Lewis acid and a strong Bronsted acid acts to produce alkylcarbonium ions from saturated aliphatic hydrocarbons, under the selective reaction conditions, add and produce polymeric chains. The strong Lewis acid is one which has a relatively greater ability to accept an electron pair. The Lewis acids which are most useful in the invention comprise halides of metals from Groups IIIA to VIIA of the Periodic Chart, although atoms outside these groups can be present as well. The Bronsted acids which are effective in the method of the invention are those which most readily give up a proton. The strong, Bronsted acids in the inventions include the following; HF, HSO_3F, HSO_3CF_3, HPO_2F, HCl, HSO_2Cl, $HClO_4$ and H_2SO_4. The amount of acid combination present can be as high as one mole of total acid per mole of monomer.

REISSUES

MARCH 2, 1976

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

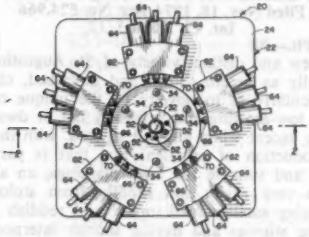
Re. 28,726
VEHICLE WHEEL MANUFACTURING APPARATUS

Dalton M. Davis, 3433 Via La Selva, Palos Verdes Estates, Calif. 90274

Original No. 3,725,992, dated Apr. 10, 1973, Ser. No. 123,329, Mar. 11, 1971. Application for reissue Mar. 22, 1974, Ser. No. 453,688

Int. Cl.² B23P *19/04*

U.S. Cl. 29—208 D **16 Claims**



5. A vehicle wheel manufacturing apparatus to construct the vehicle wheel assembly, said assembly being composed of a rim to be capable of supporting an inflatable vehicle tire and a spider located interiorly of said rim, said manufacturing apparatus comprising:

a first means to position said spider within said rim, said spider having *formed therein* a plurality of *separate* depressions *arranged in a circumferential row about said spider* [formed therein and located directly adjacent said rim]; and

second means to effect deformation of said rim into cooperation with said depressions, said second means includes an actuator assembly, said actuator assembly including a separate actuator for each of said depressions, a manifold assembly to connect together a plurality of said actuator to maintain such in a predetermined fixed relationship relative to said apparatus.

Re. 28,727
CIRCULAR IRRIGATION SYSTEM WITH WORM GEAR DRIVE

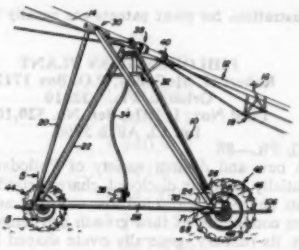
Richard F. Reinke, P.O. Box 480, Deshler, Nebr. 68340

Original No. 3,623,662, dated Nov. 30, 1971, Ser. No. 884,117, Dec. 11, 1969. Application for reissue Nov. 29, 1973, Ser. No. 419,928

Int. Cl.² B05B *3/12*

U.S. Cl. 239—177 **11 Claims**

1. In an irrigation system having a boom movable over a relatively large land area and including an elongated pipe receiving water for discharge through a plurality of sprinkler heads, that improvement comprises a plurality of support assemblies for the boom, each support assembly including an elongated frame member generally in perpendicular relation to the boom, a wheel journalled at each end of the elongated frame member for engaging the ground surface, a drive motor supported from the frame member, and a driving connection between said motor and [each of] said wheels for driving the wheels and propelling the support assembly thus propelling the elongated boom, said drive connection including a worm pinion and worm wheel to provide positive driving connection between the motor and wheels to prevent free wheeling of the wheels in the event of traversal of a downgrade, each wheel including a spindle, means connecting the spindle to the frame member, a wheel hub journalled on said spindle, a wheel [and pneumatic tire] secured to the hub, said worm wheel being secured to said hub for rotation therewith *about a common axis* whereby rotation of the worm wheel will drivingly rotate the wheel, *said means connecting the*



spindle to the frame means including means enabling the spindle to pivot approximately 90° whereby the axes of rotation of the wheels may be parallel to the axis of the boom or perpendicular thereto, and means disengaging the drive connection between the motor and wheels to enable the boom to be towed.

Re. 28,728
PROCESS FOR SYNTHESIZING SPECIFIC COMPLETE MIXED POLYOL ESTERS

David Evans O'Connor, and Glen Reid Wyness, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Original No. 3,808,245, dated Apr. 30, 1974, Ser. No. 279,574, Aug. 10, 1972. Application for reissue Oct. 31, 1974, Ser. No. 519,500

Int. Cl.² C11C *3/02*

U.S. Cl. 260—410.7 **17 Claims**

1. A process for preparing specific complete mixed polyol esters from [unsymmetrically substituted] partial polyol esters with substantially no ester group rearrangement comprising esterifying [said] *a* partial polyol [esters] *ester* with an acid anhydride in the presence of a catalytic amount of a boron trifluoride source, *said partial polyol ester being from the group consisting of partial polyol esters from aliphatic diols having the hydroxyl groups unsymmetrically substituted with respect to the carbon chain and partial polyol ester from aliphatic polyol containing at least three hydroxyl groups.*

Re. 28,729
PROCESS FOR SYNTHESIZING SPECIFIC COMPLETE MIXED POLYOL ESTERS

Jerry Joseph Yetter, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Original No. 3,809,712, dated May 7, 1974, Ser. No. 279,577, Aug. 10, 1972. Application for reissue Oct. 31, 1974, Ser. No. 519,498

Int. Cl.² C11C *3/02*

U.S. Cl. 260—410.7 **19 Claims**

1. A process for preparing specific complete mixed polyol esters from [unsymmetrically substituted] partial polyol esters with substantially no ester group rearrangement comprising esterifying [said] *a* partial polyol [esters] *ester* with an acid anhydride in the presence of a catalytic amount of a hydrogen bromide source [.] , *said partial polyol ester diols having the hydroxyl groups unsymmetrically substituted with respect to the carbon chain and partial polyol esters from aliphatic polyol containing at least three hydroxyl groups.*

PLANT PATENTS

GRANTED MARCH 2, 1976

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,831
PHILODENDRON PLANT
Robert H. McColley, P.O. Box 17126, Orlando, Fla. 32810
Filed Nov. 1, 1974, Ser. No. 520,106
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—88 **1 Claim**

1. A new and distinct variety of Philodendron plant, substantially as herein disclosed, characterized as to novelty by its ability to withstand low moisture and high temperature conditions, its slow growth and retention of form indoors, its rubbery, generally ovate shaped leaves which are yellow-green and have dark red petioles and stems.

3,832
CHRYSANTHEMUM (MINUTEMAN)
Leonard H. Shoesmith, Westfield, Woking, Surrey, England, assignor to Pan-American Plant Company, West Chicago, Ill.
Filed Nov. 4, 1974, Ser. No. 520,426
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—79 **1 Claim**

1. A new and distinct cultivar of chrysanthemum substantially as herein shown and described, characterized by the Spanish orange and greyed yellow coloration of its large and open blooms of a composite and decorative incurve type, and by its very dark and glossy foliage.

3,833
CHRYSANTHEMUM PLANT (BRANDYWINE)
Leonard H. Shoesmith, Westfield, Woking, Surrey, England, assignor to Pan-American Plant Company, West Chicago, Ill.
Filed Nov. 4, 1974, Ser. No. 520,429
Int. Cl. A01h *5/00*
U.S. Cl. Plt—81 **1 Claim**

1. A new and distinctive variety of chrysanthemum plant, substantially as herein shown and described, characterized by the dark pink center and light pink outer petal coloring of its decorative type flowers, its production of five to six lateral breaks when pinched, and its excellent dispray pot habit.

3,834
ST. AUGUSTINE GRASS
Curran L. Garrett, P.O. Box 337, Ingleside, Tex. 78362
Filed Nov. 18, 1974, Ser. No. 524,966
Int. Cl. A01h *5/12*
U.S. Cl. Plt.—88 **1 Claim**

1. A new and distinct variety of St. Augustine grass, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a low-growing and relatively flat or dwarf habit of growth except when allowed to seed, with the consequent production of excellent turf that is particularly attractive and suitable for lawn plantings; an ability to propagate very easily and rapidly from stolons, said stolons being smaller in diameter and reddish in color with white stigmas and having shorter internodes than other varieties of St. Augustine grass; good hardiness to temperatures as low as 15° F.; heavy production of highly viable, fertile but heterozygous seed which germinate rapidly, said seed being borne in seed heads of a relatively uniform height of about 10 to 12 inches; good tolerance to St. Augustine decline virus (SADV), with the ability to quickly recover from such virus when or if exposed to heavy infections thereof; and better resistance to many other turf diseases than common St. Augustine grass.

3,835
ORCHID PLANT (REALITE)
Maurice Lecoufle and Michel Vacherot, Boissy-St.-Leger, France, assignors to Les Petits-Fils et Fils de Vacherot & Lecoufle, Boissy-St.-Leger, France
Filed Nov. 20, 1974, Ser. No. 525,404
Claims priority, application France, Nov. 29, 1973, 42,578
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct variety of orchid plant of the Cymbidium species, substantially as herein shown and described, characterized by its vigorous growth and rapid bulb producing habits, its abundant production of large regularly spaced flowers having long peduncles, its attractive coloration, and mid-November to end of December flowering with full production about mid-December.

PATENTS

GRANTED MARCH 2, 1976

ERRATA

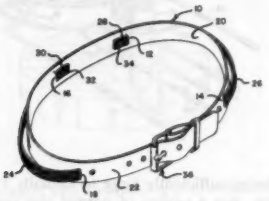
For CLASS	See PATENT NO.
030–278	3,940,842
055–016	3,940,912
073–067.8 R	3,940,952
098–002.11	3,941,034
122–032	3,941,099
139–122 W	3,941,158
350–096	3,941,474
416–244	3,941,506
156–234	3,941,596
324–030 R	3,941,665
423–306	3,941,896
310–155	3,942,045
323–044 R	3,942,106

PATENTS

GRANTED MARCH 2, 1976

GENERAL AND MECHANICAL

3,940,801
PILLION RIDER BELT
Lawrence H. Riggs, 304 Watson Ave., Fairmont, W. Va. 26554, and William J. Curn, 397 Lawson Ave., Steubenville, Ohio 43952
Filed Nov. 4, 1974, Ser. No. 520,364
Int. Cl.² A41F *9/00*
U.S. Cl. 2—311 **1 Claim**

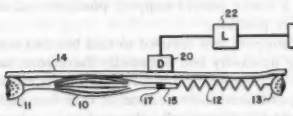


1. A pillion rider belt comprising:
a. a belt having four slits spaced apart along a longitudinal axis of the belt, the belt having an inside face and an outside face;
b. a pair of straps along the longitudinal axis of the outside face of the belt, the ends of each of the straps being inserted through a corresponding slit and fastened to the inside face of the belt; and
c. means fastening the belt.

3,940,802
MEDICAL APPLIANCE MADE OF PLASTIC
Eiji Sako, Osaka, and Hisasi Sasamoto, Matsubara, both of Japan, assignors to The Green Cross Corporation, Japan
Filed Jan. 24, 1975, Ser. No. 544,008
Int. Cl.² A61F *1/24, 1/22, 1/00*; A61M *5/14*
U.S. Cl. 3—1.4 **6 Claims**

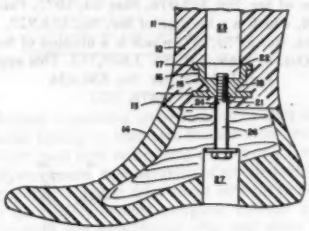
1. A medical appliance suitable for use in direct or indirect contact with human blood, characterized by being fabricated from plasticized polyvinyl chloride comprising 100 parts by weight of polyvinyl chloride and 50 to 100 parts by weight of thermoplastic polyesterbased polyurethane used as plasticizer, said polyurethane having a softening point of about 70°C and giving in a thin-layer chromatogram no spot other than the one at the original position where a test sample has been loaded.

3,940,803
METHOD AND SYSTEM FOR CONTROL OF A POWERED PROSTHETIC DEVICE
Edmund B. Weis, Jr.; Craig R. Hassler, and John H. Flora, all of Columbus, Ohio, assignors to Battelle Memorial Institute, Columbus, Ohio
Filed May 6, 1974, Ser. No. 467,073
Int. Cl.² A61F *1/00, 1/06*
U.S. Cl. 3—1.1 **8 Claims**



3. A transcutaneous system for controlling the motion of a powered prosthetic limb comprising:
a. an externally, electromagnetically detectable article of a size and shape to be internally placed on a biological site capable of being moved by the action of a remaining muscle; and
b. electromagnetic detection means externally adjacent said article disposed to generate control signals to the limb's power means in relation to the displacement of said article.

3,940,804
ANKLE BLOCK
Cecil Thomas Benton, Saratoga; John Maher Freter, Santa Clara, and Robert R. Moore, Hayward, all of Calif., assignors to Hosmer/Dorrance Corporation, Campbell, Calif.
Filed Mar. 10, 1975, Ser. No. 557,018
Int. Cl.² A61F *1/04, 1/08*
U.S. Cl. 3—30 **2 Claims**

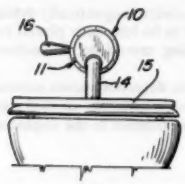


1. A prosthetic ankle block comprising a generally cylindrical member contoured to resemble a human ankle and cast of rigid foam material, including an anchoring insert imbedded in said foam material for anchoring a prosthetic foot to said ankle block; said insert including an upper cylindrical portion having an upper flange extending radially outwardly therefrom into said foam material, a medial portion comprising a frusto-conical member integrally formed with and subjacent to said upper portion, and a lower flange extending radially outwardly from the lower, narrow end of the medial portion; said insert including a hole extending axially therethrough and a counterbore extending into the end surface of the upper portion thereof; and said ankle block including an upper passage communicating with said counterbore and a lower passage extending to the lower opening of said hole.

3,940,805
SELECTIVE VOLUME FLUSH VALVE
William O. Sievers, 512 Milwaukee St., Denver, Colo. 80206
Filed Aug. 18, 1975, Ser. No. 605,646
Int. Cl.² E03D *1/34, 5/02*; A61B *19/00*
U.S. Cl. 4—67 A **18 Claims**

1. An automatic flush valve for delivering a predetermined amount of water upon each acutation thereof comprising a closed casing having an inlet for water under pressure and an outlet, a valve comprising a plate for closing said outlet mounted for sliding movement across said outlet and having an opening therethrough movable into alignment with said outlet for affording the passage of water through said outlet, said opening having a leading edge and a trailing edge, actuator means for sliding said plate from its outlet closing position a predetermined distance across said outlet to a position wherein said leading edge has moved to effect a partial opening of said outlet, and driving means dependent upon the

resulting passage of water through said valve for sliding said plate in the same direction as by said actuator means until said



trailing edge passes said outlet to close said valve and stop the flow of water.

3,940,806

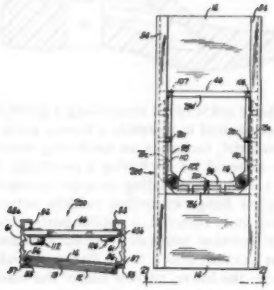
FREE-STANDING SHOWER STALLS

Bernard Mustee, Cleveland, Ohio, assignor to E. L. Mustee & Sons, Inc., Cleveland, Ohio

Division of Ser. No. 359,078, May 10, 1973, Pat. No. 3,895,398, which is a division of Ser. No. 158,927, July 1, 1971, Pat. No. 3,751,737, which is a division of Ser. No. 864,716, Oct. 8, 1969, Pat. No. 3,609,773. This application Jan. 3, 1975, Ser. No. 538,436

Int. Cl.² A47K *3/22*

U.S. Cl. 4—146 **4 Claims**



1. An assemblage of parts of a self-standing shower stall for insertion in a shipping container comprising:

a. first and second parallel extending frame members each having a generally U-shaped cross-section;

b. each of said frame members defining a longitudinal slot, and said members oriented with said slots opening toward each other;

c. walls of said shower stall extending between said frame members and supported thereby; and,

d. a side of a wall extending into and engaged with a slot in said first frame member and a side of a wall extending into and engaged with the slot in said other frame member.

3,940,807

SAFETY SUCTION OUTLET FOR POOLS

William O. Baker, Corona Delmar, and Charles S. Johnson, Laguna Niguel, both of Calif., assignors to Baker Hydro, Inc., Irvine, Calif.

Filed Aug. 13, 1974, Ser. No. 496,944

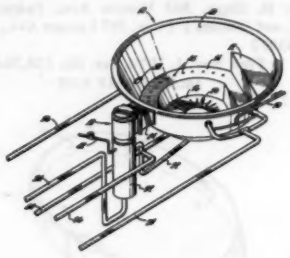
Int. Cl.² E04H *3/18, 3/16*

U.S. Cl. 4—172 **16 Claims**

1. A safety suction outlet for a pool comprising:

a drain aperture in the bottom of said pool; and

means for extending the pool water outlet area for flow into said drain aperture to include an area on said bottom of said pool much larger than said aperture, said extending



means being sufficiently large to virtually eliminate the possibility that a person of normal size could block a sufficient portion of the outlet area to create a heavy suction on said person when said person is positioned on said outlet area.

3,940,808

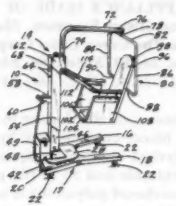
PATIENT TRANSFER APPARATUS

Bartholomew Petrini, 7517 North Ridge Drive, Omaha, Nebr. 68112

Filed Oct. 21, 1974, Ser. No. 516,282

Int. Cl.² A61G *1/02*

U.S. Cl. 5—86 **8 Claims**



1. A patient transfer apparatus, comprising, a wheeled base,

an upstanding post means secured at its lower end to said base and extending upwardly therefrom, said post means being length extendible,

power means for extending said post means,

a patient support means secured to said post means and extending therefrom,

said patient support means comprising a bracket means which embraces said post means and which is selectively, vertically, adjustably mounted on said post means,

first and second spaced apart support arms extending laterally therefrom,

said support arms being individually, pivotally mounted on said bracket means to permit said arms to be moved between a lower patient support position and an upper inoperative position,

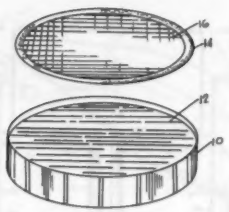
and a third support arm secured to said bracket means and extending upwardly and outwardly therefrom, said third support arm comprising a substantially vertically disposed portion positioned intermediate of said first and second support arms, said vertically disposed portion being rotatably mounted on said bracket means about a vertical axis, said third support arm also comprising a substantially horizontally extending portion extending from the upper end of said vertically disposed portion.

3,940,809

SWIMMING POOL COVER

George A. Hughes, Oakville, Canada, assignor to The Raymond Lee Organization, Inc., a part interest

Filed Aug. 26, 1974, Ser. No. 500,336
Int. Cl.² E04H 3/19
U.S. Cl. 4—172.12 3 Claims



1. In combination with a swimming pool containing water to a preselected level and having an inner periphery:

a hollow air filled flexible waterproof endless loop shaped to conform to said periphery and floating on top of the water, the loop having an open central region and bearing continuously against the periphery, said loop in vertical cross section defining a circle and having a peripheral opening closed by a removable plug whereby the loop can be inflated for use and deflated for storage; and

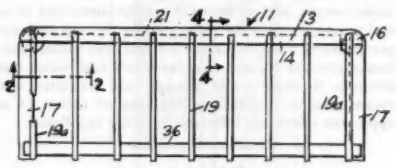
a thin flat flexible horizontal dark colored plastic waterproof sheet closing said region and sealed at its periphery to said loop, said sheet being adapted to float in water.

3,940,810

BOX SPRING, BOX SPRING FRAME AND MAKING SAME

Daniel Krakauer, Great Neck, and C. Leonard Krakauer, Roslyn Heights, both of N.Y., assignors to Kay Manufacturing Corporation, Syosset, N.Y.

Filed Nov. 21, 1974, Ser. No. 525,946
Int. Cl.² A47C 23/08; A47K 13/10
U.S. Cl. 5—241 12 Claims



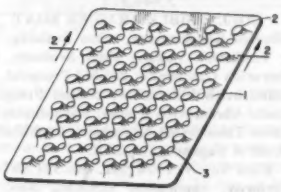
1. In a box spring having a box spring structure comprising a frame including side rails, an end rail at each end of the frame and cross slats extending between the side rails and means for forming a self-reinforcing structural unit with spaced apart members at each end of the frame connected together to cooperate in mutually transferring stresses therebetween and adequate to support concentrated loads on relatively small areas at the end portion of the box spring, said means comprising a longitudinal brace adapted to support all of the slats, the upper member of the structural unit being the end slat, the lower member of the unit being the end rail and the member connecting the end slat and the end rail being an end portion of the brace, said end portion having a lower surface in secured engagement with the upper surface of the end rail adjacent thereto, said portion having an upper surface in secured engagement with the lower surface of the end slat adjacent thereto, said end slat forming a support for the bottom coils of an end row of coil springs at the end portion of the box spring, the width of said upper surface of the end slat being sufficient to arrange said end row of springs in the proper position for upholstering.

3,940,811

LIGHTWEIGHT CONSTRUCTION MATERIALS AND ARTICLES MADE THEREOF

Masami Tomikawa, Chiba; Hiroyuki Ishitobi, Tokyo, and Hideo Ohkawa, Chiba, all of Japan, assignors to Idemitsu Kosan Kabushiki-Kaisha (Idemitsu Kosan Co., Ltd.), Tokyo, Japan

Filed July 16, 1973, Ser. No. 379,493
Claims priority, application Japan, July 17, 1972, 47-83369[U]
Int. Cl.² A47C 27/15, 27/22
U.S. Cl. 5—361 R 4 Claims



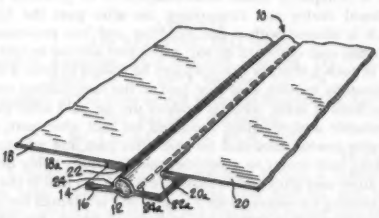
1. A mattress comprising an assembly of a core of a structural material having on each side thereof a flat sheet of soft resilient foam, said core comprising a sheet of a foamed mixture of polymer consisting essentially of an ethylene homopolymer or copolymer and at least about 30% up to about 60% by weight of a finely divided inorganic calcium compound having a particle size up to about 10μ, said sheet being deformed on its two opposite sides into a pattern of rows of alternating concavities and convexities with adjacent rows thereof being staggered relative to one another and the patterns on said opposite sides having a mating complementary configuration, the thickness of said sheet being less than the minimum extent of said concavities and convexities.

3,940,812

WELT CONSTRUCTION

Otto Zapf, Eschborn, Germany, assignor to Knoll International, Inc., New York, N.Y.

Filed Mar. 24, 1975, Ser. No. 561,302
Int. Cl.²A47C 27/00
U.S. Cl. 5—360 3 Claims



1. A partially-recessed welt construction for joining together two edges of material, which comprises:

an elongated welt core;

an upper welt core cover positioned above said welt core and a lower welt core cover positioned therebelow, said covers extending beyond each side of said core;

means for joining said welt core covers together at both sides of said core to form an enclosure therefor; and

means for symmetrically joining the upper portion of each side of said core enclosure to an edge of said material to be joined, the edges of material so joined being positioned above the lowermost portion of said core by at least one thickness of upper core cover material, thereby to partially recess said core enclosure with respect to the joined edges of material.

3,940,813

COLLAPSIBLE TRAILER BOAT

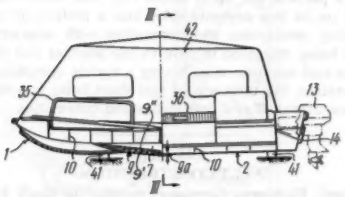
Alexei Kirillovich Konstantinov, ulitsa Svobody, 15, kv. 86; Vladimir Vasilievich Volkov, ulitsa Svobody, 15, kv. 52; Viktor Petrovich Gaschenko, Bolshoi Prospekt, 46, kv. 45; Igor Vladimirovich Lukashkov, Bolshoi Prospekt, 46, kv. 30; Alexandr Abramovich Klitsov, Karantinnaya ulitsa, 86, and Valentin Timofeevich Kuzmenko, Prokhladnaya ulitsa, 5, kv. 14, all of Taganrog, U.S.S.R.

Filed Nov. 7, 1974, Ser. No. 521,897

Claims priority, application U.S.S.R., Nov. 13, 1973, 1966005

Int. Cl.² B63B *7/04, 1/20*

U.S. Cl. 9—2 C **4 Claims**



1. A collapsible trailer boat adapted to be powered by an outboard motor and comprising: an after part the hull of which is shaped with a flat deadrise and has provision for mounting said outboard motor; a fore part jointed to said after part in such a manner that they can be folded to form a trailer by pivotally moving said fore part in the longitudinal centerplane until it rests, with its bottom up, on said after part; a retractable undercarriage mounted on said after part; a removable towbar mounted on said after part and adapted for hitching said trailer to a vehicle; said fore part being detachable from said after part, which fore part has a hull in the form of a planing catamaran with a tunnel and is adapted for use as a separate craft; a removable hydroplate which, for the purpose of using the complete boat bodily, is shaped to close the portion of said catamaran tunnel adjacent to the after part and to conform the shape of the bottom of said catamaran to the shape of the bottom of said after part, said hydroplate forming a transverse step at the junction of said fore and after parts, a gap being provided at said step for water to be drawn from the said catamaran tunnel when the craft is planing.

3,940,814

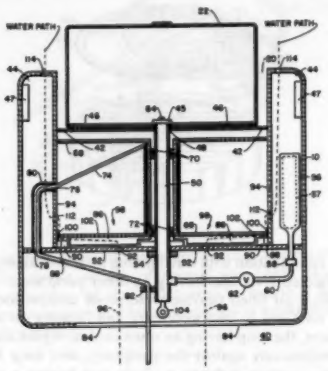
PORTABLE SALVAGE LIFT

John J. Bayles, and Theodore J. Roster, both of Oxnard, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 13, 1974, Ser. No. 505,815

Int. Cl.² B63C *7/02, 7/26*

U.S. Cl. 9—8 R **20 Claims**



1. An apparatus for underwater lifting in an essentially vertical direction through a column of water comprising:

a. housing means;

b. an inflatable member connected to said housing means;

c. means communicating with said inflatable member for inflating said member, thereby rendering said apparatus positively buoyant when said inflatable member in inflated;

d. cable means for serving as a tether line;

e. reel means having at least one flange rotatably connected to said housing means for housing said cable means, said reel means permitting said cable means to unwind therefrom, thereby permitting said apparatus to rise when said inflatable member is inflated; and

f. a water pump having a housing, inlet means, restricted outlet means, and an impeller rigidly connected to said reel means whereby the water passing through said water pump exerts a slowing force on said reel means due to forces created on said impeller when said water pump attempts to expel water through said restricted outlet means, thereby controlling the rate of ascent of said apparatus when said inflatable member is inflated.

3,940,815

QUICK FOOT RELEASE FOR SWIM FIN

James E. Hill, Bremerton, Wash., assignor to Imperial Manufacturing Company, Bremerton, Wash.

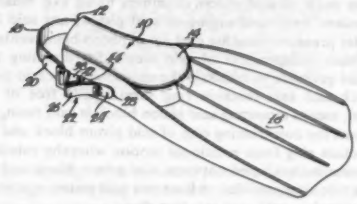
Continuation of Ser. No. 356,784, May 3, 1973, abandoned. This application May 15, 1974, Ser. No. 470,209

Int. Cl.² A63B *31/08*

U.S. Cl. 9—309 **1 Claim**

1. A swim fin comprising: means defining a hollow, foot receiving portion having a heel opening whereby a swimmer may insert a foot into said hollow foot receiving portion, and an opposed toe portion; a flexible blade extending forwardly of and integral with said toe portion; a flexible strap adapted to bear against the heel of a swimmer when the swimmer has his foot received in said hollow foot receiving portion, said strap having one end secured to said foot receiving portion adjacent said heel opening; means secured to said foot receiving portion adjacent said heel opening at a point opposite said strap one end for quickly releasing said strap, said means comprises a lever having one end pivotally secured to said foot receiving portion, a handle portion on said lever projecting

away from said pivotally secured end, a link having one end pivotally connected to said lever intermediate the ends of said lever, the other end of said link being secured to said strap other end, said link includes a V-shaped formation intermediate its ends to allow a portion of said link to pass about said one end of said lever and move into substantial abutment with a portion of said lever, and means for holding said lever in a



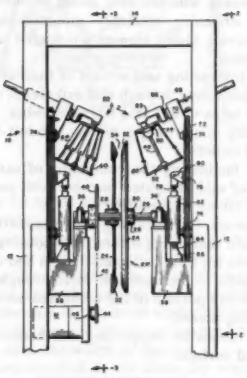
position wherein said handle portion is directed away from said heel receiving opening, said holding means includes means locating said lever one end substantially outwardly of said foot receiving portion so that said lever and said link define an overcenter toggle system, said locating means comprises a bracket secured to a lug on the exterior of said foot receiving portion, said bracket having first and second tabs bearing against said foot receiving portion at spaced locations.

3,940,816

SIDE LASTING APPARATUS

Horst M. Leonhardt, 50 Charles St., East Weymouth, Mass. 02189

Filed Aug. 8, 1974, Ser. No. 495,813
Int. Cl.² A43D 21/00
U.S. Cl. 12—7 **18 Claims**



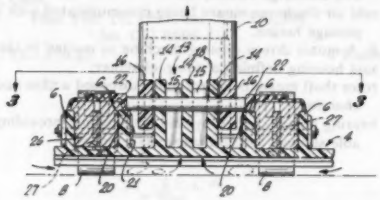
1. Apparatus for applying a wiping stress to the upstanding lasting margin of an upper mounted on a last, comprising a support for a last, an instrumentality mounted adjacent the support for the last, said instrumentality embodying a series of flexible elements supported in a plane inclined downwardly and outwardly relative to the side of the last, means yieldably pressing the instrumentality towards the side of the last such that as each element is brought into engagement with the shoulder of the last it is stretched about the shoulder of the last against the bottom and non-yielding means freely rotatable in the direction of movement of the last to which the upper ends of the elements are attached having a surface disposed substantially parallel to the bottom of the last such as to apply a force to that part of the element engaged with the bottom which is substantially perpendicular thereto.

3,940,817

ANTI-CLAMPING SUCTION HEAD FOR SWEEPING SWIMMING POOLS

Walter R. Levack, 7900 Chase Ave., Los Angeles, Calif. 90045

Filed Oct. 18, 1974, Ser. No. 515,914
Int. Cl.² F04H 3/20
U.S. Cl. 15—1.7 **9 Claims**



1. A suction head for vacuum cleaning a swimming pool bottom utilizing a suction line connected to a source of suction, wherein the suction head is adapted to be moved across the pool bottom by a pole manipulated by an operator positioned adjacent the pool, the suction head comprising:

a platform composed of material having at least limited flexibility extending in longitudinal and transverse directions;

means supporting said platform for motion while maintaining said platform spaced above the pool bottom in generally parallel relation thereto;

an opening extending upwardly through said platform, said opening on its upper side adapted for connection to the suction line;

at least two vertical, transversely extending inner ribs connected to said platform spaced longitudinally on opposite sides of said opening;

a pillar connected to said platform adjacent said opening projecting upwardly between said inner ribs spaced therefrom;

a yoke adapted to connect the pole to said pillar, said yoke at least partially embracing said pillar; and

a rigid pin extending longitudinally through said pillar and through adjacent portions of said yoke said pin connecting the pole to said platform for pivoting motion about a horizontal, longitudinally extending axis, said pin having end portions projecting beyond said yoke in opposite direction into contact with the adjacent said inner ribs to prevent vertical flexing of said platform in the region thereof between said inner ribs to an extent sufficient to prevent adjacent regions of the underside of said platform from deflecting into contact with the pool bottom.

3,940,818

AIR BLOWING MACHINE

Clifford E. Anderson, 6440 Hillcroft, Houston, Tex. 77036

Filed Feb. 26, 1973, Ser. No. 335,576
The portion of the term of this patent subsequent to Apr. 30, 1991, has been disclaimed.
Int. Cl.² A47L 5/24; B43L 19/02
U.S. Cl. 15—3.53 **18 Claims**

1. A motor driven erasing machine having a housing, a chuck tube being disposed within said housing and being rotatably driven by an electrically energized motor, said chuck tube having a chuck mechanism at the lower extremity thereof for supporting a strip of erasing material, the improvement comprising:

means defining air passage means within said chuck tube and extending lengthwise of said eraser strip and directing air flowing therethrough against the surface being erased in the immediate vicinity of the area of contact between the eraser strip and the surface being erased;

air supply means completely enclosed within said housing and developing a flow of air simultaneously with energization of said electric motor; and

means communicating said flow of air with said air passage means.

4. A motor driven erasing machine as recited in claim 1:

said means developing a flow of air being a pump mechanism disposed within said housing and defining air suction and discharge means; and

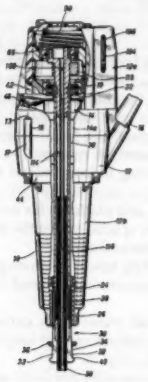
said air discharge means being communicated with said air passage means.

6. A motor driven erasing machine as recited in claim 4:

said housing defining a pump chamber;

rotor shaft means being rotatably disposed within said pump chamber;

bearing means carried by said housing and providing rotatable support for said rotor shaft means;



rotor means being eccentrically carried by said rotor shaft means and being oscillatable within said pump chamber upon rotation of said rotor shaft means;

follower vane means being movably received within said housing and being disposed in engagement with said rotor, said follower vane means defining a movable partition separating the space between said rotor and said housing into variable volume suction and compression chambers; and

means urging said follower vane means into engagement with said rotor at all times.

7. A motor driven erasing machine as recited in claim 6:

said rotor shaft means having a passage formed therein, said passage conducting air from said pump means to said air passage means.

3,940,819

HYDRAULIC POWERED HANDWASHER

Raymond F. McMackin, 171 Mount Pleasant Road, Smithtown, N.Y. 11787; Richard B. Britton, 60 Dyke Road, Setauket, N.Y. 11733, and Kenneth E. Robins, 6 Shirley St., Center Moriches, N.Y. 11934

Filed Nov. 21, 1973, Ser. No. 418,090

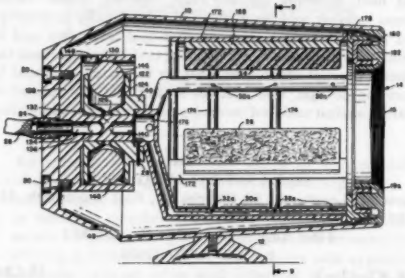
Int. Cl.[2] A47K 7/04

U.S. Cl. 15—21 C **9 Claims**

1. A fluid energized washing device for cleaning the terminal end of an elongated member, comprising in combination:

means for providing a stream of fluid under pressure;

fluid energized motor means for providing rotational power, said motor means activated by said stream of liquid under pressure, said motor means having in combination means defining a vented casing, vented to ambient having an inner wall section in the form of a reaction ring, means defining a piston blockhaving a plurality of equi-length radially disposed piston chambers radially interconnected to a central axial bore, means defining a piston for each of said piston chambers, means for directing fluid under pressure selectively into each of said piston chambers in outwardly urging relationship to said piston and for selectively and sequentially directing the flow of said fluid from each of said piston chambers to an exit means in response to inward urging of said piston, any said fluid under pressure escaping past a said piston being vented to ambient independent of said means for directing fluid under pressure to maintain the space between said piston block and said reaction ring substantially free of said fluid, means mounting said piston block in said casing and means for constraining one of said piston block and said reaction ring from rotational motion whereby rotational motion is developed between said piston block and said reaction ring provided at least one said piston is in urging relationship with said reaction ring;



means defining a laving member rotationally driven by said motor means wherein said laving member is a hollow conduit driveably rotatably mounted on said motor means having laving elements mounted along the inner wall thereof;

means for interacting said stream of fluid after said stream of fluid has exited through said exit means with said laving member so as to wet said laving member, said means for interacting comprising a hollow conduit having radially directed outlets;

means for facilitating the contacting of said terminal-end portion of said elongated member with said laving member in a laving relationship;

housing means for enclosing and supporting said motor means and said laving means, said housing means including a drain for fluid collected therein and an access opening adapted to the insertion therethrough of at least the terminal-end portion of the elongated member to contact said laving means;

and, base means for supporting said housing means on an extended surface.

3,940,820

DEVICE FOR CLEANING SHOE SOLES

Kurt Smolka, Wittenauerstrasse 82-86, Berlin, Germany (26)

Filed Jan. 24, 1975, Ser. No. 543,867

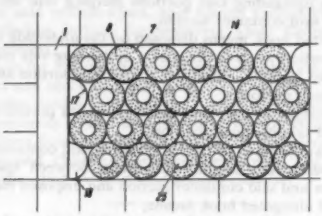
Claims priority, application Germany, Feb. 1, 1974, 2405423

Int. Cl.[2] A47L 23/22

U.S. Cl. 15—36 **7 Claims**

1. A device for cleaning shoe soles, comprising a grid having a lower supporting plate and an upper supporting plate, said upper supporting plate having rows of vertically extending cylindrical rings forming circular passages through the grid, vertical pins mounted in said lower supporting plate and extending through the axes of said rings, said upper supporting plate having round plates mounted upon said pins, ring-shaped

brushes, and means mounting said brushes upon said pins for free rotation thereon, said grid passages containing said

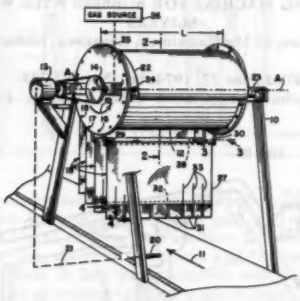


brushes, the edge of each round plate and the adjacent cylindrical ring, constituting circumferential limitations for a corresponding ring-shape brush.

3,940,821
CAR DRYER

Fred R. Moran, 1191 Calle Contento, Thousand Oaks, Calif. 91360

Filed Oct. 25, 1974, Ser. No. 517,913
Int. Cl.² B60S *3/04*
U.S. Cl. 15—97 B **8 Claims**



1. A car dryer for use in automatic car wash systems, including, in combination:

a. frame means positioned over the path of travel of a car through the car wash system;

b. a cylindrical horizontal drum rotatably mounted to the frame means above the path so that a car may pass under the drum, the axis of the drum extending transversely to the path of the car and the drum having an axial length at least equal to the width of the car;

c. motor means coupled to the drum for rotating it when energized; and,

d. a plurality of towel means coupled to the device and depending from its peripheral surface at circumferentially spaced points, each of said towel means including a large rectangular fabric material defining a curtain; a transverse rod extending parallel to the axis of the drum adjacent to the cylindrical surface thereof and coupled to opposite end portions of the drum at corresponding circumferential points, said rod supporting the upper end of said curtain; and towels individually removably fastened to the lower end of said curtain and depending therefrom whereby a car passing under the drum is successively wiped by the towel means, rotation of the drum positioning successive towel means for wiping action, and whereby should any one or more of said towels become snagged when a car is being wiped thereby, it is pulled free from said curtain without interference with the remaining towels.

3,940,822
REAR VIEW SAFETY MIRROR

Carl D. Emerick, Cridersville, and Daniel E. Davis, Lima, both of Ohio, assignors to All Weather Truck Mirror Co., Inc., Lima, Ohio

Filed Feb. 19, 1975, Ser. No. 551,296
Int. Cl.² B60S *1/44*
U.S. Cl. 15—250.22 **4 Claims**

1. In a rear view mirror of the type having bracket means for attachment to a vehicle, a planar mirror element, support means movably mounted on said bracket means for supporting said mirror element, said mirror element having a reflecting face and a rear face, the improvement comprising:

said mirror element having an aperture therethrough, a rotary electric motor mounted on said support means adjacent said rear face, said electric motor having a housing, a field winding fixedly carried in said housing, said winding having a central axis, an armature,

means mounting said armature in said housing for rotation about said central axis and movement along said axis between a first and second position with said winding surrounding at least a portion of said armature when said armature is in said second position,

a shaft having one end connected to said armature, said shaft extending along said central axis and through said aperture in said mirror element, said shaft having its other end located adjacent said reflecting face of said mirror element,

wiper means mounted on said other end of said shaft, said shaft and wiper means being rotatable and movable with said armature from said first toward said second position so that said wiper means will be pressed against said reflecting face of said mirror element,

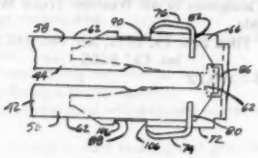
means for delivering electric current to said motor whereby a magnetic field will be established through said winding and armature to cause rotation of said armature and movement thereof from said first toward said second position to press said wiper means against said reflecting face of said mirror element.

3,940,823

END CLIP FOR BLADE REFILLS

Gary L. Rosenbeck, St. Charles, Ill.

Filed Mar. 30, 1973, Ser. No. 346,356
Int. Cl. B60s 1/02, 1/38
U.S. Cl. 15—250.42 9 Claims



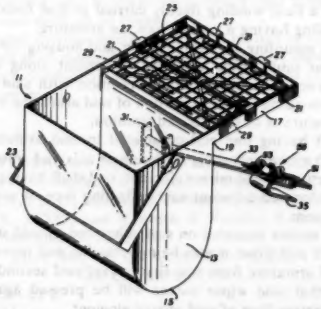
8. In a windshield wiper blade refill unit having a backing strip with two spaced elongate parallel legs, a wiper blade having a pair of oppositely facing grooves formed therein, the legs of said backing strip nesting in said grooves, and end clip secured to one end portion of the backing strip, said end clip having a body portion with spaced arms extending therefrom and lying in face-to-face relationship with the under surface of the legs of the backing strip, each of said arms having a portion adapted to be releasably engaged by claws of a superstructure and having aligned upturned tabs integrally formed on the outer edges of the arms of said end clip and adapted to be squeezed together to release the arms from engagement by the claws of the superstructure, means at the outer end of the backing strip cooperating with the body of the end clip for restraining relative longitudinal movement therebetween; and ear members integrally formed on said tabs and projecting inwardly toward each other and toward the center of the end clip and overlying the top surface of the legs of the backing strip to restrain the end clip and the backing strip from relative movement in a direction normal to the plane of the backing strip.

3,940,824

PAINT TRAY AND CONTAINER APPARATUS

Charles J. Gioia, and Mario Gioia, both of 1132 N. Main St., Jamestown, N.Y. 14701

Filed Jan. 6, 1975, Ser. No. 538,433
Int. Cl.² B44D 3/12; E06C 7/14
U.S. Cl. 15—257.06 2 Claims



1. An improved tray and container apparatus comprising:

a. a container section having a generally rectangular cross-section with an open top and a generally round bottom;

b. a tray portion integrally formed to one edge of the open top portion of said container section and extending away from said container section at an obtuse angle to form a unitary unbroken connection between the tray portion and container section;

c. said tray portion being of rectangular crosssection and having upstanding side portions merging into the open top of said container section;

d. elongated hook means disposed on the underside of said tray portion inwardly from said upstanding side portions and said integral connection of said tray portion and said container section;

e. said elongated hook means having its hook portion facing toward said container section;

f. a bracket secured to the back side of said container section below the integral connection between said tray portion and said container section and disposed medially of said elongated hook means;

g. an elongated arm movably attached to said bracket and extending outwardly from the back side of said container section and extending beyond the tray portion;

h. a movable hook member adjustably carried on said elongated arm and having its open hook portion facing in a direction opposite said elongated hook means;

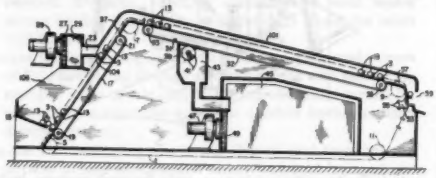
i. a handle member secured to the top portion of said container section enabling the tray and container user to easily transport the entire apparatus and to permit disposition of said elongated hook means on an upper ladder rung and said movable hook member on a lower ladder rung.

3,940,825

CLEANING MACHINE FOR BOBBINS WITH WASTE SLIVERS

Yoshio Murao, 55 Masuizumimati, Kanazawa, Ishikawa Pref., Japan

Filed June 27, 1974, Ser. No. 483,795
Claims priority, application Japan, Aug. 4, 1973, 48-92206[U]
Int. Cl.² A47L 5/34
U.S. Cl. 15—306 B 5 Claims



1. Apparatus for removing waste fibers from bobbins, comprising:

an endless chain drivable about a predetermined path of movement having mounted thereon a plurality of lugs spaced apart in the direction of movement of said chain, the distance between said lugs being greater than the diameter of a bobbin,

a hopper for receiving said bobbins and feeding said bobbins to the spaces of said chain between said lugs,

a first drivable endless belt, means for driving said first endless belt said first belt having a surface positioned with respect to a first portion of said path of movement said endless chain so as to provide a support surface for the bobbins positioned between said lugs,

a first chamber, said first chamber having an opening near said first endless belt,

a first blower connected to said first chamber, said first blower being directed to exhaust air from said first chamber, said opening being positioned such that waste fibers are removed from said bobbins by the flow of air into said opening,

a second drivable endless belt beneath a second portion of said path of movement said endless chain, means for driving said second endless belt, said second endless belt having a surface positioned with respect to said second

portion of said endless chain to provide a support surface for bobbins positioned between said lugs, said second endless belt being driven at a velocity different from that of said endless chain, said second endless belt having a pile-like surface for removing waste fibers from said bobbins,

means for directing said bobbins from said first endless belt to said second endless belt,

a roller having a plurality of combs thereon positioned in proximity to said second endless belt for removing waste fibers from said pile-like surface of said second belt,

a second chamber enclosing said roller, and means for exhausting air from said second chamber.

3,940,826

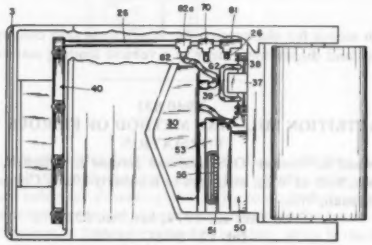
PORTABLE SURFACE CLEANER

Paul E. Phillips, Whitehall; Wilfred C. Nise, Spring Lake; Jack L. Hommes, Muskegon, and Dale E. Lowder, North Muskegon, all of Mich., assignors to Clarke-Gravely Corporation, Muskegon, Mich.

Filed Oct. 12, 1973, Ser. No. 405,916

Int. Cl.² A47L *7/00*

U.S. Cl. 15—320 **24 Claims**



1. A portable surface cleaning apparatus comprising: spray means for spraying cleaning fluid onto the surface being cleaned; a used cleaning fluid recovery chamber; a suction nozzle in flow communication with said recovery chamber; blower means in flow communication with said recovery chamber for generating a suction in said recovery chamber for causing air and used cleaning fluid to be drawn through said suction nozzle into said recovery chamber; pump means for pumping used cleaning fluid out of said recovery chamber to a remote discharge means; a discharge flow line extending from said recovery chamber, through said pump means and to a remote discharge means; and a bypass flow line connected to said discharge line upstream and downstream of said pump means to prevent dry running of said pump when liquid in said recovery chamber is depleted; said spray means including a cleaning fluid flow line operably connected to a source of cleaning fluid; a bleed-off line connected at one end to said cleaning fluid flow line and its other end to said recovery chamber, thereby short-circuiting a portion of the flow of cleaning fluid directly to said recovery chamber and thereby further preventing dry operation of said pump.

3,940,827

LEAF VACUUMING ATTACHMENT FOR ROTARY LAWN MOWERS

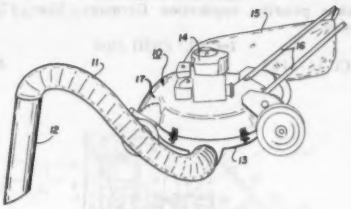
Salvatore T. Greco, 7 Parkwood Lane, Dix Hills, N.Y. 11746

Filed Apr. 18, 1974, Ser. No. 461,987

Int. Cl.² A47L *9/00*

U.S. Cl. 15—328 **10 Claims**

1. A leaf vacuuming attachment for rotary lawn mowers which include a horizontal cutting blade rotating within an inverted housing with a circumferential vertical side wall containing a discharge port therethrough that is substantially tangential to said side wall, said attachment comprising: a closure pan having a circumferential vertical side wall substantially conforming to that of said housing, the upper edge portion of said pan side wall being configured for butting contact with the lower edge of said housing side wall; an input



port in said pan side wall; and means for fastening said edges together to form an enclosed housing for said cutting blade, with said input port being below said cutting blade and rotated at least 90° upstream of said discharge port relative to the direction of rotation of said cutting blade.

3,940,828

SNAP HINGE

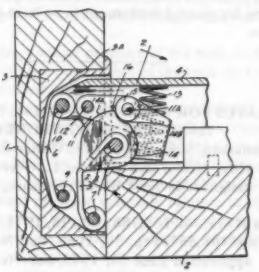
Karl Lautenschlaeger, Reinheim, Odw., Germany, assignor to Karl Lautenschlager KG Mobelbeschlagfabrik, Germany

Filed Jan. 6, 1975, Ser. No. 538,879

Claims priority, application Germany, Jan. 11, 1974, 2401178

Int. Cl.² E05D *3/06*

U.S. Cl. 16—163 **12 Claims**



1. A snap hinge for furniture doors having a carrier arm adapted to be mounted on the carrier wall of a piece of furniture and a housing adapted to be mounted in a door portion comprising:

a quadrilateral link mechanism including outer and inner longitudinally extending link members each having ends pivotally supported in the carrier arm and the housing thereby pivotally interconnecting the carrier arm and housing;

a lever arm having one end pivotally mounted on said carrier arm and the free end thereof being oscillatable in a plane perpendicular to the pivotal axis of said link members;

cam control means fixed on the end of said inner link member which is pivotally mounted in the carrier arm;

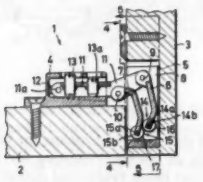
cam engaging means on said lever arm engaging said cam control means; and

biasing means urging said cam engaging means into engagement with said cam control means.

3,940,829
PARALLEL ROD FURNITURE HINGE

Hellmuth Grunert, Hoffnungstahl, and Theodor Vitt, Porz-Eil, both of Germany, assignors to Prameta Prazisionsmetall -und Kunststofferzeugnisse G. Baumann & Co., Cologne, Germany

Filed Mar. 15, 1974, Ser. No. 451,562
Claims priority, application Germany, Mar. 17, 1973, 2319549
Int. Cl.² E05D 3/06
U.S. Cl. 16—163 **5 Claims**



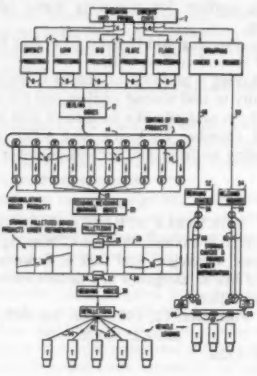
1. A hinge comprising a pair of elements each adapted to be secured to one of a pair of relatively pivotally mounted members, a pair of radius rods having opposite side edges, first means pivotally joining said pair of radius rods at one end thereof to one of said elements, second means pivotally joining said pair of radius rods at a second end thereof to a second of said elements, said radius rods being of a predetermined thickness corresponding to the width of said side edges, at least one of said first and second pivotally joining means including laterally oppositely projecting terminal projections carrying trunnions having a diameter greater than said predetermined width of said radius rods, and means journaling said trunnions for pivotal movement in at least one of said pair of elements.

3,940,830
APPARATUS FOR BREAKING ANIMAL CARCASSES AND HANDLING MEAT PRODUCTS

A. D. Anderson, Sioux City, Iowa; Walter E. Lauridsen, South Sioux City, Nebr., and Charles L. Overstreet, Sioux City, Iowa, assignors to Iowa Beef Processors, Inc., Dakota City, Nebr.

Division of Ser. No. 165,788, July 15, 1971, which is a division of Ser. No. 706,557, Feb. 19, 1968, Pat. No. 3,543,369. This application June 20, 1973, Ser. No. 371,782
Int. Cl.² A22B 5/00
U.S. Cl. 17—24 **3 Claims**

1. An integrated conveyorized facility for processing beef comprising a first area having cutting apparatus for breaking a carcass into primal cuts; a plurality of second areas each having a conveyor with an infeed end adjacent the first area for conveying a particular primal cut or subportions thereof from the infeed end to a discharge end, work stations and equipment positioned along the conveyors in the second areas for trimming, boning and subdividing the primal cuts; wrapping areas at the discharge ends of said conveyors, said wrapping areas having equipment for placing meat in heat shrinkable bags, for evacuating and sealing the bags, and for shrinking the bags; weighing areas at the discharge ends of the wrapping areas and having equipment for automatically sorting cuts of one type into groups according to weight; a box conveyor leading through the discharge end of the weighing areas for removing boxes filled with individual said groups; a sorting area at the discharge end of the box conveyor and having means for separating the boxes into sets according to the groups of cuts which they contain; a refrigerated storage area arranged to receive boxes from the sorting area and having a conveyorized lane for each said set; and, an order filling area

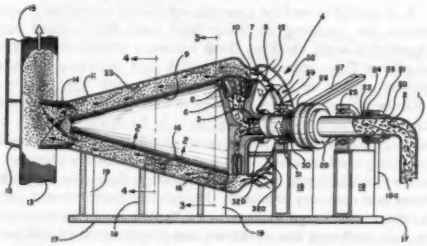


with means for discharging the boxes from said conveyorized lanes and dispatching them to a vehicle loading station.

3,940,831
ATTRITION MILL AND METHOD OF FIBROUS WEB FORMATION

Edward E. Werner, Oshkosh, and Jerome L. Mitchell, Appleton, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Dec. 13, 1974, Ser. No. 532,370
Int. Cl.² D01G 25/00
U.S. Cl. 19—156.3 **12 Claims**

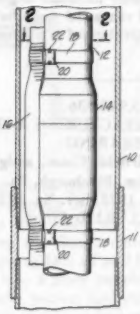


1. Apparatus for forming a fibrous batt comprising an attrition mill having circular discs which rotate relative to each other and are adapted to act on fibrous material to separate and disintegrate the material, means for feeding an airborne stream of the fibrous material to said attrition mill, a forming chamber and a forming screen, a generally conical casing coaxial with the circular discs and enclosing the discs of the attrition mill and projecting from the area of the discs toward the forming screen and terminating in the forming chamber, a conical confine within the casing spaced from the wall of the casing forming an annular path of decreasing diameter from the attrition mill towards the forming chamber and screen for the conduct of fibers from the mill to the chamber so that fibers leaving the attrition mill discs under the influence of the air stream accelerate in the annular path as they move toward the chamber, said chamber being of such dimension that fibers passing therethrough to the screen from the annular path are slowed in their movement.

3,940,832
STRAPPING FOR FASTENING PRODUCTION TUBING TO ELECTRICAL CABLE

Edward H. Kelly, Balboa, and Ernest O. Kartinen, Long Beach, both of Calif., assignors to Burmah Oil and Gas Company, Houston, Tex.

Filed Sept. 26, 1973, Ser. No. 400,859
Int. Cl.² B65D 63/02; F16L 3/04; H01B 7/18, 17/16
U.S. Cl. 24—20 R 3 Claims



1. In an apparatus for running a production tubing string into a well through the well casing to which a corrugated electrical cable for providing electricity to down hole electrical apparatus positioned in said well proximate the lower end of said casing, is fastened; wherein banding strap is used to secure said cable to said tubing string at multiple points along said tubing string, and wherein said strap is tightened to firmly secure said cable to said tubing string and a seal affixed to the joined ends of said strap intermediate the tangential points of contact made by said strap with said corrugated cable and said tubing string to lock said strap in said tightened condition, the improvement comprising:

a banding strap having a section between the tangential points of contact with said cable pre-formed to a shape conforming to the shape of said cable, said pre-formed section of said strap having corrugations longitudinal to said strap to engage said corrugated cable to minimize relative movement between said strap and said cable when said cable is subjected to tensile loading.

2. A strapping device for securing a corrugated electrical cable to a string of well tubing employed to lower said cable and down hole electrical apparatus down a well through well casing, comprising:

a. a length of strapping sufficient to transversely surround both said cable and said tubing to secure said cable to said tubing;

b. a portion of said strapping having its longitudinal section pre-formed to conform to the outer circumference of said cable between the points of tangency with said cable;

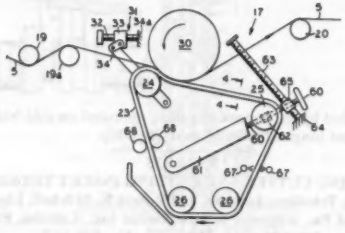
c. longitudinal corrugations in said strapping at said pre-formed section of a configuration to mate the corrugations of said cable and resist movement of said cable relative to said strapping;

d. said strapping being arranged and constructed for tightening and fastening about said tubing and cable to secure said cable to said tubing whereby the weight of said cable and electrical apparatus may be borne by said tubing without substantial deformation of said cable as said strapping is tightened around said cable and said tubing, and without elongation of said cable resulting from movement of said cable relative to said strapping.

3,940,833
METHOD FOR COMPRESSIVELY SHRINKING TEXTILE FABRICS AT HIGH SPEED

Walter S. Troope, Latham, and Jackson Lawrence, Troy, both of N.Y., assignors to Cluett, Peabody & Co., Inc., Troy, N.Y.

Filed Apr. 26, 1973, Ser. No. 354,708
Int. Cl.² D06C 21/00
U.S. Cl. 26—18.6 1 Claim



1. A method for longitudinally compressively shrinking a light weight textile fabric web at high speed; the method comprising:

preconditioning the web,

providing a nip roller and a take up roller adapted to pass a thick endless elastomeric belt into contact with a heated polished cylinder having a low frictional resistance,

feeding continuously the web over the nip roller and between the elastomeric belt and the cylinder,

selectively varying tension on the belt by adjusting positioning of the nip roller substantially tangentially relative to the cylinder,

selectively varying contact pressure of the belt on the cylinder by adjusting the positioning of the take up roller; the method characterized by:

the selective varying of contact pressure achieved by arcuately biasing the take up roller radially relative to the cylinder about a fixed pivot axis for the take up roller and by biasing the take-up roller tangentially relative to the cylinder along a plane which intersects the pivot axis,

varying the contact pressure inversely relative to the speed of feeding; whereby skipping of the belt at the high speed is eliminated and control of the pressure of the belt onto the cylinder over a greater arc is achieved.

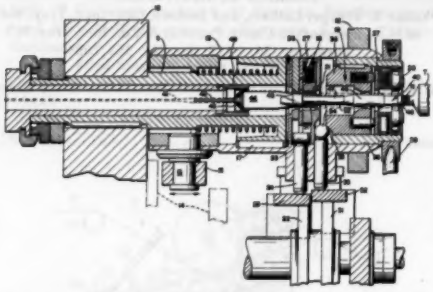
3,940,834
APPARATUS FOR SEVERING AND FEEDING LIGHTWEIGHT TUBULAR PLASTIC ELEMENTS

Dusan S. Lajovic, c/o Colgate-Palmolive Company, 300 Park Ave., New York, N.Y. 10022

Continuation-in-part of Ser. No. 340,293, March 12, 1973. This application Nov. 19, 1973, Ser. No. 417,194
Int. Cl.² B23D 25/00
U.S. Cl. 425—403 23 Claims

1. A mandrel assembly adapted for use in apparatus for expanding synthetic plastic tubing from flattened to tubular condition, severing tubular elements of predetermined length from the leading end of the expanded tubing and feeding said elements toward a use station, characterized by means defining a longitudinally extending mandrel body, tubing expanding means extending longitudinally from one end of said body within said tubing and comprising at least two angularly related webs disposed in intersecting planes with each web having opposed longitudinally extending smooth edges for

engaging the inerior of the tubing during expansion, and a tubing feed member constructed and arranged to be closely



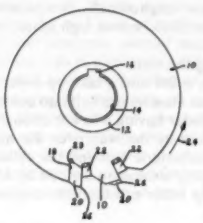
surrounded by the expanded tubing mounted on said body for movement longitudinally of said assembly.

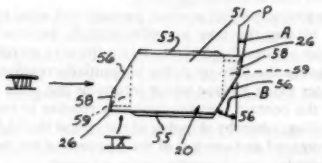
3,940,835

SLOTTING CUTTER AND CUTTING INSERT THEREFOR

Ernest J. Friedline, Latrobe, and Robert N. Mitchell, Ligonier, both of Pa., assignors to Kennametal Inc., Latrobe, Pa.

Filed May 19, 1975, Ser. No. 578,667
Int. Cl.² B26D 1/12, 1/00
U.S. Cl. 29—105 R 10 Claims





1. In a slotting cutter; a disc-like body rotatable in a predetermined direction on a central axis perpendicular to the plane of the body, a plurality of pockets formed into each side of the body in circumferentially distributed relation with the pockets in the opposite sides of the body staggered relative to each other, each pocket having a rear wall inclined forwardly in the radially outward direction and an axially bottom wall inclined axially outwardly in the forward direction and a radially inner wall inclining radially outwardly in the forward direction, each said pocket being open on the axially outer side and at the radially outer end and on the forward side, a cutting insert in each pocket having forward and rearward and end walls and parallel side walls and cutting edges on the opposite ends, each insert having an end portion protruding radially from said body when mounted in a said pocket and presenting a said cutting edge on the forward side of the radially outer end, a lateral notch in said body at the forward side of each pocket having a rearwardly facing forward wall which converges with said rear wall of the respective pocket in the radially inward direction, and a clamping wedge in each notch between said forward wall of the notch and the opposed side of said insert for clamping each insert in the respective pocket while simultaneously urging the insert toward the said rear wall and the said radially inner wall of the pocket.

8. A cutting insert, especially for a slotting cutter; comprising a body of hard wear resistant material having forward and rearward walls and parallel side walls, said insert having end regions each forming a cutting edge near the plane of a respective one of said forward and rearward walls, each end region having a first portion near the respective one of said forward and rearward walls making a first larger included angle with the plane thereof and a second portion remote from said plane and making a second smaller included angle therewith, and each of said forward and rearward walls being inclined the same angle toward the other thereof in a direction toward one side wall of the insert.

3,940,836

METHOD OF MANUFACTURING A SPHERICAL BEARING

Albert R. McCloskey, Fairfield, Conn., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Feb. 24, 1975, Ser. No. 552,352
Int. Cl.² B21D 53/10
U.S. Cl. 29—149.5 C 4 Claims

1. A method of manufacturing a spherical bearing having an outer member, an inner spherical member, bearing inserts interposed between the inner and outer members and a key disposed in a keyway in the outer member to enable the assembly and disassembly of the spherical bearing comprising the steps of forming a hole in the outer member, forming a keyway in the wall of the outer member to receive a key, forming the inner surface of the outer member to receive bearing inserts, placing the inserts in the outer member and placing the key in the keyway, forming the inner bearing surface on the inner surface of the inserts and the key, removing the key from the keyway, placing the inner member in the outer member and keyway and rotating the inner member out of the keyway, placing the key back in the keyway, rotating the inner member to its operational position.

3,940,837

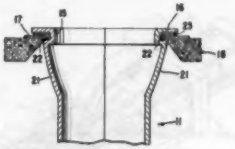
HOT AIR FURNACE WITH IMPROVED HEAT EXCHANGER CONSTRUCTION

John M. Wiese, St. Louis, Mo., assignor to The Singer Company, New York, N.Y.

Division of Ser. No. 420,756, Dec. 30, 1973, Pat. No. 3,908,629. This application Aug. 9, 1974, Ser. No. 495,990
Int. Cl.² B23P 15/26; B21D 39/06
U.S. Cl. 29—157.5 4 Claims

1. A process of securing at least one plate member to at least one heat exchange unit of a hot air furnace, comprising providing at least one forwardly extending mounting flange on each of said heat exchange units defining an opening therein, forming openings in said at least one plate member congruent with said heat exchange unit openings, providing sheet insulating material substantially coextensive with said plate member, forming openings in said sheet insulating material substantially smaller than said heat exchange unit openings positioning sheet insulating material and said at least one plate member

over said heat exchange unit with said insulating material interposed between said plate member and heat exchange unit, arranging said openings formed in said plate member in alignment with the openings defined by said mounting flanges on said heat exchange units arranging said insulating material openings covering a substantial portion of the openings defined by said mounting flanges on said heat exchange units but exposing a concentric portion of each said heat exchange unit opening, effecting relative movement between each said plate



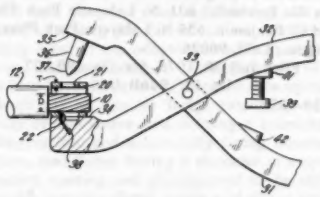
member and heat exchange unit so as to urge each of said mounting flanges through the corresponding apertures in said plate member to thus cause the portion of said insulating material overlying the flange defined openings to form a sleeve on the outer surface of said flange, thereafter expanding said flanges into a plate parallel with that of said plate member to thereby secure said plate member to said heat exchange unit with said insulating material therebetween and effect a leakproof joint between said plate member and heat exchange unit.

3,940,838

CRIMPING TOOL FOR CABLE CONNECTOR

Carl E. Gryctko, Haddon Heights, N.J., assignor to I-T-E Imperial Corporation, Spring House, Pa.

Filed Feb. 24, 1975, Ser. No. 552,202
Int. Cl.² H01R *43/04*
U.S. Cl. 29—203 DT **14 Claims**



1. Apparatus for forming a through connection passage in a stranded cable having a conductive sleeve mounted thereon in a loosely fit fashion, said sleeve being provided with first and second co-aligned openings, said apparatus comprising:

first means for forming a passage through said cable in the region between said co-aligned sleeve openings by displacement of the strands of said cable in a direction transverse to the axis of said sleeve and movement of said displaced strands towards the interior surface of said sleeve, the resulting passage being in alignment with said co-aligned sleeve openings; and

crimping means for pressing at least the portions of said sleeve surrounding said sleeve openings towards one another to move said sleeve into intimate engagement with the adjacent strands of said cable,

whereby said cable and said sleeves are brought into intimate electrical engagement and the crimped regions surrounding said openings are formed to facilitate mechanical and electrical joining of a terminal thereto;

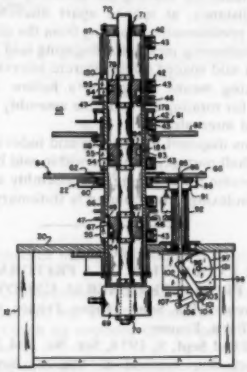
said first means operatively positioned within the formed passage to prevent collapse thereof during crimping of the sleeve and cable by said crimping means.

3,940,839

HIGH ACCURACY POSITIVE POSITIONING MECHANISM FOR AN ASSEMBLY MACHINE

Donald S. Stevens, Erie, Pa., assignor to Assembly Machines, Inc., Erie, Pa.

Filed Jan. 24, 1975, Ser. No. 543,677
Int. Cl.² B23P *19/04*
U.S. Cl. 29—208 F **23 Claims**



5. An assembly machine for use in manufacturing an article comprising:

a rotatable assembly table on which at least a portion of the article is positioned at a selected position;

a plurality of work stops located at predetermined positions around said rotatable assembly table;

indexing means connected to said rotatable assembly table for rotating said rotatable assembly table a predetermined distance at repeatable intervals;

positive locating means for engaging and positively positioning said rotatable assembly table between the repeatable intervals when said indexing means is not rotating said rotatable assembly table so that the article is accurately aligned with the associated work stop; and,

overload clutch means disposed between said indexing means and said rotatable assembly table for disconnecting said indexing means from said rotatable assembly table during an overload.

11. An assembly machine comprising:

drive means;

a main center support column;

an annular assembly table disposed around said main center support column and being supported for relative rotary movement around said main center support column;

indexing means having an input driven by said drive means and an output connected to said annular assembly table which rotates said annular assembly table through a predetermined angle at discrete spaced apart intervals;

assembly table positioning means driven by said drive means for engaging and accurately positioning said annular assembly table between the discrete spaced apart intervals when said indexing means rotates said annular assembly table;

an upper tooling mount located above said annular assembly table disposed around and supported from said main center support column;

a lower tooling mount located beneath said annular assembly table disposed around said main center support column;

a main center drive shaft disposed within said main center support column and being driven by said drive means;

an upper tooling actuating means disposed around and supported from said main center support column and

being driven by said main center drive shaft for supplying power to tooling which can be attached to said upper tooling mount; and,

a lower tooling actuating means disposed around and supported from said main center support column and being driven by said main center drive shaft for supplying power to tooling which can be supported from said lower tooling mount.

18. An assembly table positioning and indexing mechanism comprising:

indexing means for moving the assembly table a predetermined distance, at spaced apart discrete intervals, to within a predetermined spacing from the desired position;

positive positioning means for engaging said assembly table between said spaced apart discrete intervals;

said indexing means comprises a hollow indexing drive column for rotating the movable assembly table at predetermined intervals;

drive means disposed for driving said indexing means; and

a locator shaft partially disposed within said hollow indexing drive column for engaging said assembly table when said hollow indexing drive column is stationary.

3,940,840

TOOL FOR EXTRACTION OF A PREFORMED FITTING FROM A PERIPHERAL GROOVE

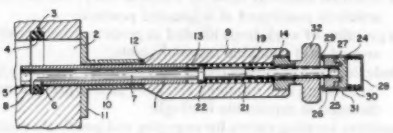
Eugene Sauveur Bellia, Saint-Tropez, France, assignor to Etat Francais, Paris, France

Filed Sept. 9, 1974, Ser. No. 504,240

Claims priority, application France, Sept. 26, 1973, 73.34438

Int. Cl.[2] B25B *27/14*

U.S. Cl. 29—235 **10 Claims**



1. A tool for extracting a preformed fitting from a peripheral groove hollowed in the wall of a bore comprising:

a cylindrical, hollow body having an external diameter less than the diameter of said bore, at least one longitudinal slit opening at one of the ends of said hollow body and at least one nose, disposed at the bottom of said slit and projecting to the outside of said hollow body;

a piston capable of sliding inside said hollow body, having at least one nose at one of the ends of said piston, positioned so as to engage in said at least one slit of said hollow body, and projecting to the outside thereof;

said tool including means for positioning said one end of said hollow body within a bore to position the nose of said hollow body and the nose of said piston at a pre-determined position within said bore.

3,940,841

CLIPPER APPARATUS FOR ATTACHING MATERIAL TO A BROOMSTICK OR THE LIKE

Clyde R. Velarde, Raleigh, N.C., and Henry G. Williams, Mount Olive, Ala., assignors to Rheem Manufacturing Company, New York, N.Y.

Filed Feb. 18, 1975, Ser. No. 550,550

Int. Cl.[2] B23P *11/00*

U.S. Cl. 29—243.56 **10 Claims**

1. Apparatus for attaching a clip about a mass comprising, in combination:

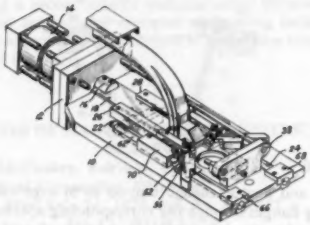
a mounting structure defining an opening for receipt of said mass, guide means on the mounting structure transverse to the axis of the opening;

punch means mounted in said guide means for reciprocation between a retracted position and a clip driving position;

clip magazine means mounted for inserting a single clip into said guide means in the path of travel of said punch means when in the retracted position;

die means mounted on the opposite side of the opening from said punch means;

first and second opposed gate members on opposite sides of said opening intermediate said die and punch means, said



gate members pivotally attached with said guide means and extensible along the sides of said opening between said guide means and said die means to form a complete, closed channel for said clip and punch means;

first and second gate actuators mounted on said structure for translation parallel with said punch means to engage said first and second gate members respectively and drive said gate members to a closed position in response to travel of the punch means from the retracted toward the clip driving position; and

means for driving said punch means.

3,940,842

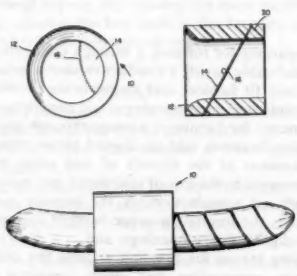
DEVICE FOR SLITTING WIENERS FOR BARBECUING

Alexandre G. Perrinelle, 631 N. Lafayette Park Place, and Edward C. Benjamin, 635 N. Lafayette Park Place, both of Los Angeles, Calif. 90026

Filed July 28, 1975, Ser. No. 599,527

Int. Cl.[2] B26B *3/00*

U.S. Cl. 30—278 **2 Claims**



1. A device for slitting wieners so that they may be barbecued, comprising:

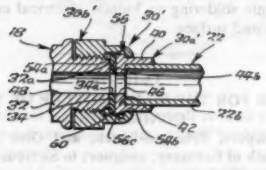
a. a plastic cylinder having an axial bore; and

b. a plastic blade which has a serrated and curved cutting edge disposed within said axial bore of said cylinder with said blade being in a plane which makes an angle in the range of 40° to 80° with the axis of said cylinder.

3,940,843
METHOD OF FORMING AN EXTENSION TUBE ASSEMBLY

William J. Yeager, Alden, N.Y., assignor to R. E. Chapin Manufacturing Works, Inc., Batavia, N.Y.

Filed Dec. 16, 1974, Ser. No. 532,894
Int. Cl.² B23P 11/00
U.S. Cl. 29—437 1 Claim



1. A method of assembling a coupling for use in adjustably-removably attaching an inlet end of a tube to an externally threaded fluid discharge nipple, which comprises:

providing a swivel cap having a base portion provided with a through opening threaded to receive said nipple and an integrally formed sleeve portion extending coaxially forwardly of said base portion and having an internal diameter in excess of the diameter of said through opening thereby to define a forwardly facing annular first stop surface;

forming an annular groove in the inner surface of said sleeve portion whereby to divide said inner surface into relatively rear and forward bearing surfaces and to define within said groove a rearwardly facing and essentially radially extending annular second stop surface;

providing a swivel cap adapter having a base and integral formed sleeve extending co-axially forwardly of said base, said base having a centrally disposed flow opening therethrough and an annular flange extending radially outwardly of said sleeve and defining a rearwardly facing sealing surface and a forwardly facing annular bearing surface, said flange having a diameter in excess of said threaded opening and dimensioned to be slidably and rotatably accommodated within said sleeve portion;

providing a sealing ring having a diameter corresponding essentially to said flange diameter and a centrally disposed through flow opening;

successively inserting said sealing ring and said swivel cap adapter into said sleeve portion to position said sealing ring adjacent said first stop surface and said flange sealing surface adjacent said sealing ring with said sealing ring and said flange in essential radial alignment with said rear bearing surface of said inner surface;

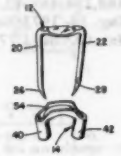
deforming said sleeve portion to radially inwardly displace portions thereof forwardly of said groove for positioning said second stop surface in facing juxtaposed relationship to said flange bearing surface and for positioning said forward bearing surface of said inner surface to slidably and rotatably receive said sleeve, thereby to permanently retain said sealing ring and said swivel cap adapter within said sleeve portion axially intermediate said first and second stop surfaces with said flow openings in essential alignment with said threaded opening; and

permanently affixing said sleeve in fluid seal relationship to said tube inlet end to position said base flow opening in flow communication with said tube.

3,940,844
METHOD OF INSTALLING AN INSULATING SLEEVE ON A STAPLE

Harold S. Colby, Bloomfield, Conn., and Raymond H. Landry, South Ashburnham, Mass., assignors to PCI Group, Inc., New Bedford, Mass.

Continuation of Ser. No. 342,852, March 19, 1973, abandoned, which is a division of Ser. No. 227,842, Feb. 22, 1972, Pat. No. 3,787,608. This application Apr. 4, 1974, Ser. No. 457,777
Int. Cl.² B23P 11/02
U.S. Cl. 29—450 16 Claims



12. The method of making an insulated staple comprising the steps of:

providing a U-shaped body member having two spaced and generally parallel legs and a bridging section connected to one end of each leg opposite the spaced, free ends of the legs;

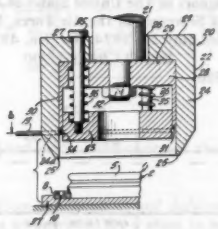
providing a flexible tube formed from an insulating material and having a length between the two opposite axial ends of the tube less than the combined lengths of the two parallel legs and the bridging section of the body member, and greater than the length of the bridging section alone, the tube having internal cross sectional dimensions corresponding approximately with the cross sectional dimensions of the legs of the body member; and

mounting the flexible tube on the U-shaped body member with the two axial end portions of the tube located coaxially on the two legs of the body member respectively with the tube walls of the axial end portions completely circumscribing the respective legs in close fitting relationship and with the remaining portion of the tube between the axial end portions extending under the bridging section of the body member.

3,940,845
METHOD OF MANUFACTURING CLOSURE FLANGES

Marian A. Czerwiak, New York, N.Y., assignor to American Flange & Manufacturing Co., Inc., New York, N.Y.

Division of Ser. No. 443,683, Feb. 19, 1974, Pat. No. 3,873,132. This application Mar. 10, 1975, Ser. No. 556,564
Int. Cl.² B23P 11/02
U.S. Cl. 29—453 3 Claims



1. A method of manufacturing closure flanges for electromagnetic bonding to containers comprising the steps of molding an annular closure flange of thermoplastic synthetic resin, supporting said flange in concentric alignment with an apply-

ing head, feeding an elongated strand of electromagnetic bonding material into said head to form an annulus displacing said head and flange toward each other, cutting said strand into a predetermined length and applying said strand as a complete annulus to said flange as said annulus is discharged from said head.

3,940,846

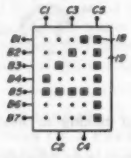
SCANNABLE LIGHT EMITTING DIODE ARRAY AND METHOD

Lawrence A. Grenon, Phoenix, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Division of Ser. No. 188,274, Oct. 12, 1971, abandoned. This application Dec. 14, 1973, Ser. No. 424,998

Int. Cl.² B01J *17/00*

U.S. Cl. 29—577 **7 Claims**



1. A process for the manufacture of a matrix of light emitting diodes, comprising the steps of:
   a. forming a plurality of mesas in an orthagonal pattern on a monocrystalline semiconductor substrate of a first conductivity;
   b. diffusing an opposite conductivity effecting material into the surface of said substrate to form a light emitting PN junction adjacent the surfaces of said mesas;
   c. forming a supporting carrier over the entire surface of said substrate;
   d. removing said monocrystalline substrate to separate said mesas into an orthagonal matrix of light emitting diodes electrically isolated in said supporting carrier and with the PN junction extending to the surface;
   e. depositing a dielectric layer over the surface of the ioslated photo diodes;
   f. placing a conductive layer thereon contacting said light emitting diodes in a plurality of rows;
   g. placing a second dielectric layer thereon; and
   h. placing a conductive layer thereon contacting said light emitting diodes in a plurality of columns.

3,940,847

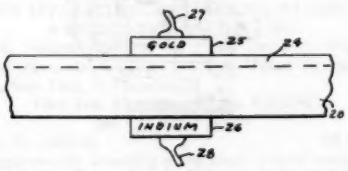
METHOD OF FABRICATING ION IMPLANTED ZNSE P-JUNCTION DEVICES

Yoon Soo Park, Kettering, and Bok Kyoon Shin, Dayton, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed July 26, 1974, Ser. No. 492,075

Int. Cl.² B01J *17/00*

U.S. Cl. 29—590 **5 Claims**



1. A method of fabricating a P-N junction device in an aluminum doped n-type ZnSe single crystal having a first (110) plane surface and a second (110) plane surface comprising the steps of:
   a. heat treating the said crystal in molten zinc for approximately 24 hours at approximately 900°C;
   b. implanting a p-type layer on the said first surface by directing a phosphorus ion beam having an energy within the range from 70 to 500 keV on the said first surface providing a dosage from 10^{16} to 10^{14} per square centimeter;
   c. annealing the said crystal at a temperature within the range from approximately 400° centigrade to approximately 650° centigrade for approximately five to ten minutes;
   d. depositing a gold electrical contact on the said implanted p-type layer; and
   e. ultrasonic soldering an indium electrical contact to the said second surface.

3,940,848

METHOD FOR THE MANUFACTURE OF TUBULAR CONDUCTORS

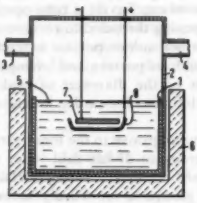
Heinrich Diepers, Erlangen-Bruck, and Otto Schmidt, Erlangen, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Jan. 28, 1974, Ser. No. 437,227

Claims priority, application Germany, Feb. 15, 1973, 2307461

Int. Cl.² H01V *11/00*

U.S. Cl. 29—599 **10 Claims**



1. An improved method for manufacturing tubular conductors which consist of a niobium layer and a layer of normal conducting metal in which a ribbon consisting of the two layers and having its edges, niobium flanges is first fabricated, after which the ribbon is bent to form a tube so that the niobium flanges at both edges abut, which flanges are then joined together, wherein the improvement comprises the steps of:
   a. plating a copper body using fusion electrolysis to form a niobium layer on one wide and two narrow sides; and
   b. rolling the body so formed to obtain a ribbon to be used in making the tubular conductor.

3,940,849

METHOD FOR HANDLING CONNECTORS

Jerry B. Minter, Normandy Heights Road, Morristown, N.J. 07960

Filed Sept. 9, 1974, Ser. No. 504,233

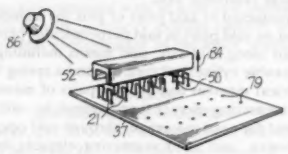
Int. Cl.² H01R *43/00*

U.S. Cl. 29—628 **6 Claims**

1. The method of handling resilient wire electrical connector members, each comprising a pair of legs extending generally parallel to each other to a pair of respective free ends, the other ends of each pair of legs being joined together by bent, integral sections of said wire, said method comprising the steps of:
   A. inserting the free ends of each of said members in respective holes in a heat-conductive jig, said holes being aligned in pairs spaced apart along two parallel straight lines;

B. heating said jig and said members;

C. fitting a thermoplastic holder over the bent, integral sections of said heated members, the temperature of said members being higher than ambient temperature of portions of said holder not in contact with said members and being sufficiently high to soften the contiguous sections of said holder to allow mutually opposite pressure between said heated members and said holder to force a portion



of each of said legs to impress itself at least partially into a respective contiguous portion of said holder to form one of said grooves;

D. allowing said holder to cool in contact with said members to a sufficiently low temperature to set said contiguous portions of said holder in gripping engagement with the respective ones of said members as a unitary structure; and

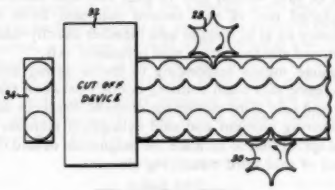
E. removing said unitary structure from said jig.

3,940,850

METHOD OF MAKING ELECTRICAL CONTACTS

John A. Rauenbuehler, New Berlin, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Feb. 27, 1975, Ser. No. 554,100
Int. Cl.² H01R 9/00
U.S. Cl. 29—630 C **6 Claims**



1. A method of making electrical contacts comprising the steps of:

pre-forming a flat uniform continuous strip into a multiple-contact strip having a series of contact disks partially left connected to one another at their adjacent peripheral edges through a narrow integral connecting part sufficiently strong to provide adequate stiffness for mechanical feeding while providing substantially round contacts when a tangential cut is made through the connecting part between each pair of contact disks, said strip consisting of good electrical conducting material such as precious metal or the like;

forming a continuous base strip of electrical conducting material;

simultaneously feeding the two strips contiguously into a connecting device and therein rigidly securing the multiple-contact strip to the base strip to provide a combined strip from which electrical contacts may be cut off;

feeding said combined strip into a cutting device with accurate registration of said narrow connecting part with respect to the cutter;

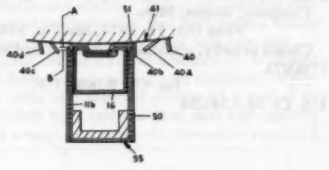
and operating said cutting device to make a tangential cut, centered between adjacent disks, through said combined strip.

3,940,851

HAIR-RAISING PANEL FOR ELECTRIC RAZOR

James E. Zookus, 505 Cherry, SE., Grand Rapids, Mich. 49503

Filed June 12, 1974, Ser. No. 478,620
Int. Cl.² B26B 19/42
U.S. Cl. 30—34.2 **13 Claims**



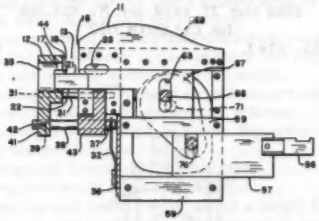
1. In a cutting head for an electric shaver having a thin screen and a driven cutting blade movably mounted within and engaging the inside surface of said screen, the screen having a top surface and a pair of sides, a plurality of openings through the top of said screen, portions of said openings extending down said sides through which individual hairs may pass to be sheared by said blade, the improvement in said cutting head comprising: a thin panel of rigid material extending parallel to and seated tightly against a side face of said screen, the top edge of said panel abutting said side face of said screen and being parallel with the top surface of said screen and in the same general horizontal plane as the inside surface of the top of said screen and overlying the lower part of those portions of said openings extending down said side of said screen for erecting individual hairs into a posture generally normal to the skin as the hairs pass into the openings in the screen for shearing by the blade.

3,940,852

PORTABLE HAND-HELD POWER-OPERATED SHEET CUTTING DEVICE

Ernest H. Ruf, deceased, late of Hayward, Calif., by Norma J. Ruf, executrix, 26589 Eldridge Ave., Hayward, Calif. 94544

Filed Oct. 21, 1974, Ser. No. 516,154
Int. Cl.² B23D 27/02
U.S. Cl. 30—241 **6 Claims**



5. A portable hand-held power-operated sheet-cutting device comprising:

a support;

means spaced from said support and defining therewith a slot providing an entryway for a sheet to be cut;

a tool mounted for reciprocation across said slot substantially perpendicular to said support, said tool being formed with a shoulder offset in the direction of said entryway and providing a cutting edge confronting said support for impacting a sheet against said support and shearing a section of material therefrom;

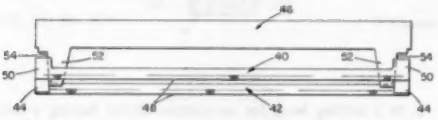
means adapted for mounting said support on a saber saw having a reciprocating saw chuck; and
means connecting said tool to said chuck.

3,940,853

SHAVING UNIT WITH BLADE TENSIONING MEANS

John F. Francis, Woking, England, assignor to The Gillette Company, Boston, Mass.

Filed Oct. 11, 1974, Ser. No. 514,025
Claims priority, application United Kingdom, Apr. 19, 1974, 17363/74
Int. Cl.² B26B 21/22
U.S. Cl. 30—346.58 18 Claims



1. A razor blade unit comprising two elongated blade members, at least one long edge of each being constituted by a cutting edge, spacer members securing said blade members together at the opposite ends thereof, and a wedge having opposed end faces in engagement with the adjacent inner faces of said spacer members and extending in a direction perpendicular to the planes of said blade members, said wedge being in compression to strain the ends of said blade members apart and maintain both of said blade members in tension.

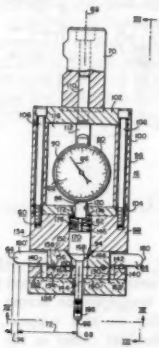
5. A razor blade unit in the form of an open rectangular frame that includes an elongated blade portion and two spacer portions, one at each end of said blade portion, and thickness of each said space portion being greater than the thickness of said blade portion, at least one long edge of said blade portion being constituted by a cutting edge, the opposite ends of said blade portion being connected to said spacer portions and said blade portion being unsupported intermediate its opposite ends so that the intermediate area between said opposite ends is open and assists in the clearing of shaving debris,
and wedge means fixed in compressive engagement within said open rectangular frame in engagement with said spacer portions to tension said cutting edge.

3,940,854

THREE AXIS PRECISION MEASURING DEVICE

Robert E. L. Maxey, North Huntingdon, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 27, 1974, Ser. No. 455,160
Int. Cl.² G01B 3/22
U.S. Cl. 33—174 L 6 Claims



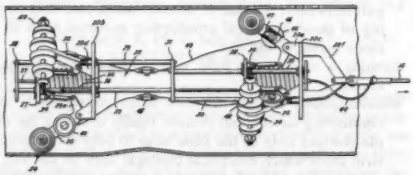
1. A device for measuring the dimensions of a member comprising:
a casing having an opening defining a reference axis therethrough,
a first and a second pair of measuring pins movably mounted in said casing, each pin in each pair being 180° from the other, the first pair being orthogonal to the second pair, each pin in each pair terminating in a tip with each tip being displaceable in a plane perpendicular to said reference axis, each tip of each pin being disposed a predetermined distance plus a finite overage distance from said reference axis,
means connected to said pairs of pins for translating forces exerted on said pairs in said perpendicular plane to forces directed along said axis, said means including an axially displaceable cylindrical member and a spring biasing said cylindrical member against said pairs of measuring pins,
a third measuring element orthogonal to said pairs and mounted for axial movement through said opening within said casing, said third measuring element mounted on said cylindrical member,
gauge means operatively associated with said force translating means and said third measuring element for indicating displacement thereof, said gauge means including an activating member engaged against said cylindrical member, indicating displacements of said first and second pairs of measuring pins and of said third measuring element,
said gauge means responding to forces translated along said reference axis by said cylindrical member of said translating means from said first pair of pins against said spring bias to indicate when abutting contact between one of said first pair of pins and said member have displaced one of said first pair said finite overage distance so as to dispose said member exactly said predetermined distance from said reference axis,
said gauge means responding to forces translated along said reference axis by said cylindrical member of said translating means from said second pair of pins against said spring bias to indicate when abutting contact between one of said second pair of pins and said member have displaced one of said second pair said finite overage distance so as to dispose said member exactly said predetermined distance from said reference axis,
said gauge means responding to forces acting along said reference axis when abutting contact between said member and said third measuring element displaces said third measuring element and said cylindrical member against said spring bias to indicate the magnitude of said displacement of said third measuring element.

3,940,855

PIPELINE PIG

Burton Ver Nooy; Larry D. Payne, and Robert L. Kendall, all of Tulsa, Okla., assignors to T. D. Williamson, Inc., Tulsa, Okla.

Filed July 19, 1974, Ser. No. 490,201
Int. Cl.² E21B 47/08; G01B 5/12, 7/12
U.S. Cl. 33—174 L 10 Claims



9. A system for remotely detecting a condition in a pipeline comprising, in combination; a pipeline pig having means for detecting a condition as it exists along a pipeline; said pig carrying memory means for storing an output from said detecting means said memory means being a potentiometer,

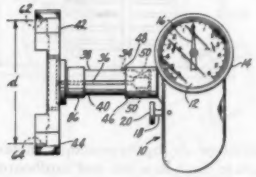
means for changing the effective resistance of the potentiometer responsive to a change in the output of said detecting means; a readout means located remotely from the pig for periodically reading the output stored in said memory means while the pig is in a pipeline; and transmission means connecting said memory means to said readout means.

10. A roller adapted for use with a pipeline pig to sense abnormalities in the configuration of the inner circumference of a pipeline comprising a shaft, a plurality of roller segments mounted thereon, the segments as a group having the configuration of a prolate spheroid with at least one segment having a radius such that its periphery extends radially beyond the prolate spheroidal configuration of the other segments.

3,940,856
MICROMETER CALIPERS

Franklin Meyer, Jr., P.O. Box 1, Forestdale, R.I. 02824

Filed Feb. 28, 1974, Ser. No. 446,712
Int. Cl.² G01B 3/34
U.S. Cl. 33—178 R **6 Claims**

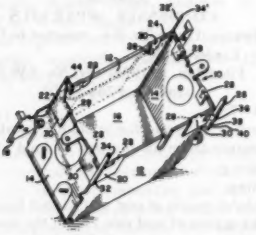


1. An external micrometer gaging assembly adapted to being detachably coupled to an amplifying and indicating mechanism comprising a longitudinally slotted elongated body formed with a deformable area and a pair of spring limbs, a pair of C-shaped measuring members having interdigitated arms mounted on the distal ends of the limbs, together formed with a socket partly in each of the adjacent arms and each with a measuring surface adapted to engage an external surface on a work piece, a plunger formed with a conical end mounted for longitudinal motion in the body and having the conical end adapted to be spring pressed by the mechanism into the socket to engage and spread apart opposite points on the socket, whereby spreading apart of the points causes contraction of the distance between the measuring surfaces.

3,940,857
CUT-OUT LOCATIONS MARKING METHOD, MEANS, AND METHOD OF FORMING SAID MEANS

Anthony J. Giordano, 19 Garfield Road, Wayne, N.J. 07470

Filed June 12, 1974, Ser. No. 478,786
Int. Cl.² G01B 3/00
U.S. Cl. 33—189 **7 Claims**



1. In a means for marking cut-out locations, for wall-bounded outlet boxes, switch boxes, and the like, on wallboard, paneling, and the like, for use in combination with such outlet or switch boxes, and for use together with a plurality of said means for marking, in order that all said means for marking will impress discrete marks representative of an appropriate, geometric pattern of a cut-out, having a marker responsive to an engagement thereof with wallboard, paneling, and the like, for impressing only one, unitary, isolated mark on such wallboard, paneling, and the like whereat the latter and said marker engage; and means for resiliently and releaseably clasping said marker to an outlet box, switch box, and the like;

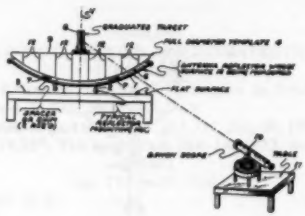
the improvement characterized in that said marker has an axis, and a marking end at one end of said axis; and

said clasping means defines a clip of substantially U-shaped cross-section for axially receiving, and resiliently engaging, opposite sides of a selected portion of a wall of an outlet box, switch box, and the like; said clip opening opposite said one end of said axis, therein to receive a wall portion.

3,940,858
METHOD OF MEASURING ANTENNA REFLECTOR SURFACE ACCURACY

Emmanual J. Perrotti, Ramsey, and Donald Roy Leger, East Hanover, both of N.J., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Apr. 28, 1975, Ser. No. 572,353
Int. Cl.² G01N 21/00; G01C 15/00
U.S. Cl. 33—228 **12 Claims**



1. A method of measuring antenna reflector surface accuracy comprising the steps of:

a. mounting said antenna reflector whose surface is to be measured on a moderately level surface;

b. centrally locating a relatively thin full diameter template having a curved edge conforming to the desired curvature of said reflector surface and a straight edge in said antenna reflector at a selected location;

c. placing spacers of selected thickness between said curved edge and said reflector surface to space said curved edge from said reflector surface a given amount;

d. mounting a graduated target on said straight edge at the central vertical axis of said antenna reflector;

e. supporting a bench scope on a table disposed at a convenient distance from said target;

f. levelling said bench scope on said table;

g. aiming said bench scope at said target;

h. employing said bench scope to read a height from said target with said template at said selected location;

i. measuring the spacing between said curved edge and said reflector surface at m intervals along said template at said selected location, where m is an integer greater than one;

j. repeating steps (b), (c), (g), (h) and (i) for $(n-1)$ other different positions of said template, where n is an integer greater than one;

k. recording said n height readings and said m spacing measurements of steps (h), (i) and (j) in the form of a matrix having n rows corresponding to said n positions of said template and $(m+1)$ columns corresponding to said m spacing measurements and said height reading for each of said n positions of said template;

l. calculating an average template height from each of said *n* height readings;

m. calculating a change in template height for each of said height readings from said height reading for each of a particular row of said matrix and said average template height;

n. weighting said *m* spacing measurements of each of said *n* rows of said matrix by an associated one of said change in template heights;

o. calculating an average of said *m* weighted spacing measurement from said *m* weighted spacing measurements for each of said *n* rows of said matrix;

p. calculating a change in spacing between said curved edge and said reflector surface for each of said *m* weighted spacing measurement in each of said *n* rows by said matrix from each of said *m* weight spacing measurements in each of said N rows of said matrix and said average of said *m* spacing measurements; and

q. calculating said surface accuracy by calculating a root mean square reflector surface error from said change in spacing

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3,940,859

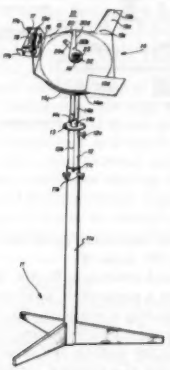
UNITARY SPACE TRANSIT

Ralph Troseth, 609 Dutchmans Drive, Rogers, Ark. 72756

Filed Nov. 11, 1974, Ser. No. 522,349

Int. Cl.[2] G04B *49/04*

U.S. Cl. 33—270 **12 Claims**



1. A space transit, comprising:

a. support means rotatable about both a vertical axis and a horizontal axis;

b. a rotary plate mounted on said support means so as to rotate about a principal axis perpendicular to the face of said plate and to said horizontal axis, said plate having three integral subplates upstanding perpendicular to said face, two of said subplates providing a space aperture and space trace combination and with an hour scale inscribed on said face indexed to a line parallel to the axis of said combination;

c. a meridian marker structure cooperating with said hour scale on said plate mounted on said support means to both rotate about said principal axis and to be locked against rotation independent of said plate;

d. a second marker means rotatably mounted on the third of said subplates so as to rotate about an axis normal to said principal axis; and

e. a space object pointer attached to said second marker means and positioned on a side of said third subplate opposite to said second marker means.

3,940,860

METHOD AND APPARATUS FOR DRYING A HYGROSCOPIC MATERIAL POSSESSING FIBROUS STRUCTURE

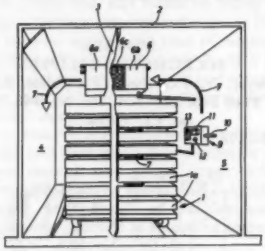
Josef Unterreiner, Lucerne, Switzerland, assignor to Pretema A.G., Birmensdorf, Switzerland

Filed Dec. 13, 1974, Ser. No. 532,485

Claims priority, application Switzerland, Dec. 18, 1973, 17862/73

Int. Cl.[2] F26B *21/06*

U.S. Cl. 34—46 **2 Claims**



1. A method of drying hygroscopic material possessing fibrous structure, such as wood and cardboard, and which is impinged in a closed drying compartment by a flowing drying medium, which is heated and demoisturized, the improvement comprising the steps of: after the introduction of the material to be dried into the drying compartment heating the drying medium to a predetermined temperature, maintaining throughout the entire drying process the drying medium at this predetermined temperature, moving the drying medium past the material to be dried in order to take-up the moisture expelled by such material, and from the point in time when there is reached the aforementioned predetermined temperature and a fixed value of the moisture content of the drying medium, and after expiration of a predetermined time duration, demoisturizing the drying medium for such length of time until its moisture content has dropped to the aforementioned fixed value, thereafter in alternate sequence interrupting the demoisturizing of the drying medium during the entire predetermined time duration from a point in time when there is momentarily attained the aforementioned fixed value of the moisture content of the drying medium, and then after expiration of the aforementioned predetermined time duration demoisturizing the drying medium for such length of time until its moisture content has reached the aforementioned fixed value.

3,940,861

CONDENSER APPARATUS

Joseph H. Frazar, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Jan. 9, 1975, Ser. No. 539,577

Int. Cl. F26b *21/06*

U.S. Cl. 34—75 **6 Claims**

1. Condenser apparatus for removing moisture from air by passing moisture-laden air through a cloud of cooling liquid droplets having:

a. a housing,

b. liquid inlet means at one end of said housing,

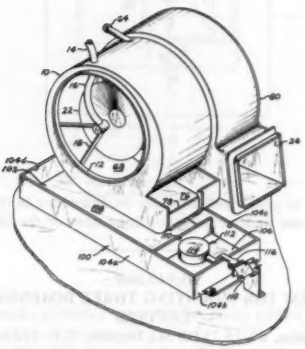
c. air inlet means at said one end of the housing,

d. air outlet means at the end of the housing opposite the air inlet means,

e. a condensing chamber between the air inlet and outlet,

f. means to form a liquid droplet cloud within the condensing chamber,

g. means for inducing air to flow from the air inlet means through the condensing chamber to the air outlet means,
h. means for collecting liquid droplets which is positioned within the housing and located between the means to form a liquid droplet cloud and the air flow inducing means,
i. a pump for removing liquid from the condenser apparatus,
j. means for driving the rotatable components including the pump, and
k. an auxiliary liquid discharge outlet having an opening outside the condensing chamber,



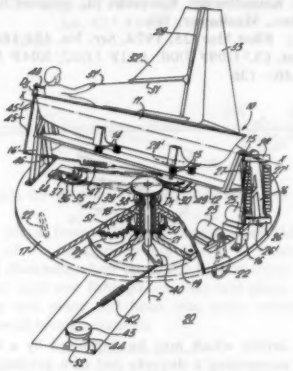
the improvement comprising apparatus deenergization means having a tray with sidewalls and two compartments, the first compartment underlying the auxiliary discharge outlet and having a liquid level sensing means connected in cooperative relationship to a switch for de-energizing the apparatus and the other compartment being separated from the first by a partition of a height sufficient to retain liquid until the liquid level sensing means de-energizes the apparatus and lower than the side walls of the tray.

3,940,862
SAILING SIMULATOR

Kaoru Nishimura, Kyoto, Japan, assignor to Shimadzu Seisakusho Ltd., Kyoto, Japan

Filed Sept. 24, 1974, Ser. No. 508,801
Claims priority, application Japan, Oct. 3, 1973, 48-111667; Oct. 3, 1973, 48-111668
Int. Cl.[2] G09B 9/06
U.S. Cl. 35—11 **11 Claims**

1. Sailing simulator comprising: a hull provided with a boom for handling a sail and a rudder; first supporting means, first elastic means interposed between said hull and said first supporting means for resiliently mounting said hull to said first supporting means, second supporting means for supporting said first supporting means so that said first supporting means is swingable about the longitudinal axis of said hull, said second supporting means being rotatable about a vertical axis; drive means for causing said first supporting means to swing about said longitudinal axis and said second supporting means to rotate about said vertical axis; and second elastic means interconnecting said first supporting means and said drive means for summing the driving force from the drive means to

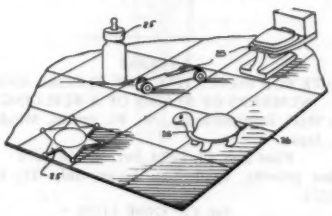


swing said first supporting means and the force produced by the weight and position of a crew.

3,940,863
PSYCHOLOGICAL TESTING AND THERAPEUTIC GAME DEVICE

Nathan I. Kritzberg, Tenafly, N.J., assignor to Psychotherapeutic Devices, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 167,372, July 30, 1971, Pat. No. 3,779,557. This application Dec. 14, 1973, Ser. No. 424,682
Int. Cl.[2] A63F 3/00
U.S. Cl. 35—22 R **9 Claims**



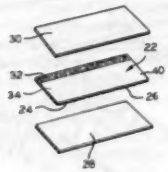
1. A psychological testing and therapeutic game device adapted to be employed to invoke fantasizing for purposes that include psychological testing and therapy comprising:
a stimulus board,
a set of icons arranged on said board,
the predominent portion of the icons on said board each evoking a significant primary emotion,
said icons comprising a plurality of sub-sets of icons, each of the icons in any one of said sub-sets evoking the same primary emotion, each sub-set evoking a different primary emotion,
a set of cards, each having first indicia thereon and each card of said set bearing second indicia referring to one of said primary emotions and requesting the selection of one of said icons corresponding thereto,
a pair of dice having a plurality of faces, a first portion, less than the whole, of said faces each having an indicia thereon identical to said first indicia on said set of cards.

3,940,864

PLASTIC PLATES ADAPTED TO BE IMPRINTED AND METHODS OF MANUFACTURING AND IMPRINTING ON PLASTIC PLATES

James C. Kanzelberger, Riverside, Ill., assignor to Contemporary, Inc., Manitowoc, Wis.

Filed Mar. 25, 1974, Ser. No. 454,166
Int. Cl.² G09F 7/00; A61F 13/02; E04F 13/20
U.S. Cl. 40—136 7 Claims



1. An article which may be imprinted by a hot-stamping process, comprising a discrete pad of a predetermined augmented plaque size having at least three superimposed layers, a first of said layers being a hot-stamping foil having an overlying coloring matter which transfers from said foil when said foil is subjected to heat and pressure, and a second of said layers comprising a plate of plastic material having a heat deformable characteristic such that said material debosses under said heat and pressure, said plate being separable along an edge in the augmented dimension to form an appendage portion and a separate plaque-sized plate portion, said first layer being attached to said appendage with said coloring matter in face-to-face contact with at least part of said plate portion, said plate having an adhesive on a side opposite the foil, whereby said plate material is debossable and said coloring matter will be deposited in the debossment when said plate is subjected to localized heat and pressure.

7. The article of claim 1 and indicia formed by hot stamping said pad of layers to deboss an image in said plastic plate portion with said coloring matter embedded in said debossment.

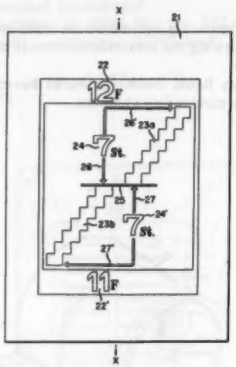
3,940,865

PLATE FOR INDICATING THE FLOORS AND THE NUMBERS OF STAIRS OF A BUILDING

Toshio Mori, Dainimiharuso, No. 81, Iguchi, Mitaka, Tokyo 181, Japan

Filed July 10, 1974, Ser. No. 487,071
Claims priority, application Japan, July 21, 1973, 48-84685[U]
Int. Cl.² G09F 13/20
U.S. Cl. 40—134 5 Claims

1. A safety plate for installation in a building staircase or the like comprising stair indicating means on a generally central portion of said plate depicting a cross sectional representation of the actual stairs in said staircase between floors at one location in said staircase where said safety plate is installed, numerical indicating means on said plate indicating the actual number of stairs between floors in said staircase at said one location, arrow indicating means on said plate positioned to relate said numerical indicating means to said stair indicating means so that the number of actual stairs between floors in said staircase at said one location are readily depicted by and discerned from said stair indicating means, said numerical indicating means and said arrow indicating means, lower floor indicating means on a lower portion of said plate indicating the actual floor of said building at the foot of the actual stairs at said one location, upper floor indicating means on an upper portion of said plate indicating the actual floor of said building at the head of the actual stairs at said one location, all of said means comprising a luminous paint viewable under unlighted conditions of said staircase such that the plate is adapted to be viewed by a stair ascender or descender under said unlighted



condition to guide said ascender or descender in negotiating said staircase under emergency conditions or the like.

3,940,866

SYSTEM FOR MOUNTING THREE DIMENSIONAL LETTERS

Louis Kaplan, 67-23 211th St., Bayside, N.Y. 11336

Filed Apr. 7, 1975, Ser. No. 565,497
Int. Cl.² G09F 7/06
U.S. Cl. 40—142 R 10 Claims

1. A system for mounting three dimensional letters on a support surface, said system comprising:

a. at least two clips mounted on the support surface, a first of said clips being positioned adjacent a bottom edge of each letter with a second of said clips being positioned adjacent a side edge of each letter, each said clip including a base wall and a tongue extending therefrom for engaging the letter, said tongues of said first and second clips being initially at approximately a right angle with respect to each other, said tongue of at least said second clip being deformable whereby when the letter is mounted on the support surface, said tongues of said first and second clip form an obtuse angle with respect to each other to thereby lock the letter in place;

b. means for rigidly securing said first and second clips to the support surface; and

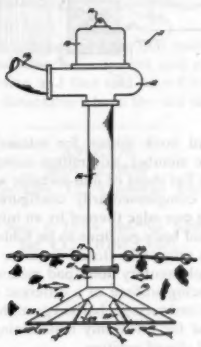
c. a movable clamping member mounted on the support surface for engaging the top edge of each letter.

3,940,867

GUIDANCE VALVE FOR FISH PUMPS

Matthew John Sikich, 3171 Westmount Place, West Vancouver, British Columbia, Canada

Filed July 16, 1974, Ser. No. 488,915
Int. Cl.² A01K 79/00
U.S. Cl. 43—6.5 4 Claims



1. An intake guidance valve for fish pump apparatus having a centrifugal pump comprising:

a. a substantially frusto-conical shield open at each end connectable at its smaller end to the intake of the pump apparatus,

b. a substantially conical deflector disposed in and co-axially of the shield and spaced from walls of the shield so as to provide a tapering annular passage, the deflector extending outwards of the open end of the shield,

c. an annular flange extending radially from the base of the deflector and spaced from the base of the shield,

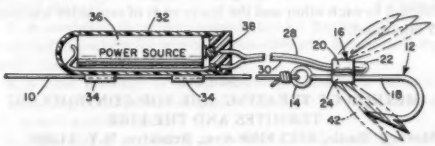
d. guidance vanes disposed between the walls of the deflector and the shield dividing the annular passage into a plurality of upwardly tapering guidance passages, said vanes extending from the annular flange towards, but short of the apex of the deflector.

3,940,868

FISH LURE

Michael E. Northcutt, 1704 Miramonte Ave., Mountain View, Calif. 94040

Filed Nov. 30, 1973, Ser. No. 420,666
Int. Cl.² A01K 85/00
U.S. Cl. 43—17.6 13 Claims



1. A fish lure comprising:

a light emitting diode having a body portion and a light emitting portion,

means for attaching one of said portions to fish hook means, and,

power supply means for energizing said light emitting diode.

3,940,869

ARTIFICIAL FISHING LURE

Eldon E. Roberts, 13400 E. Whittier Blvd., Suite C., Whittier, Calif. 90605

Filed Aug. 21, 1974, Ser. No. 499,169
Int. Cl.² A01K 85/00
U.S. Cl. 43—42.53 12 Claims

1. A process for forming an artificial fishing lure comprising:

cutting a piece from a sheet of compressed dehydrated sponge of the type which expands to at least twice it original thickness when water is added thereto;

inserting at least one fishing hook into said piece; and

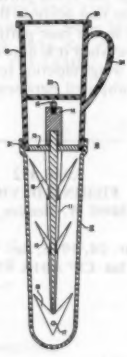
immersing said piece and hook into water whereby said compressed sponge expands.

3,940,870

BAIT HOLDER

Kjell Pettersen, 819 Patton Place Road, Forked River, N.J. 08731

Filed Jan. 23, 1975, Ser. No. 543,275
Int. Cl.² A01K 83/06
U.S. Cl. 43—44.2 10 Claims



1. In apparatus for holding a bait, the combination comprising:

elongated rod means made of a substantially rigid material;

guard means for concentrating bait engaging force, said guard means dividing said rod into first and second portions and having a perimeter projecting outwardly from said rod to define the outer limit of a space surrounding said portions;

grip means included in said first portion and abutting said guard means;

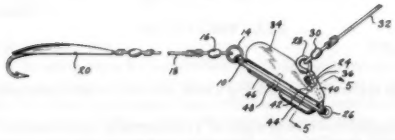
apertures for accepting tie-on lines, one aperture being located at each end of said rod means, and

a plurality of bait engaging barbs projecting outwardly from said second portion wherein each barb projects outwardly a distance less than the distance between said second portion and said outer limit whereby said guard means can accomodate and hold in place a barb covering sheath surrounding said second portion.

3,940,871
TROLLING SINKER
William E. Evans, 524 N. 28th St., Milwaukee, Wis. 53208
Filed May 13, 1974, Ser. No. 469,175
Int. Cl.² A01K 91/00
U.S. Cl. 43—43.13 7 Claims

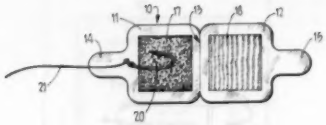
1. An integrally molded trolling sinker comprising a streamlined body with two wings and at least one fin projecting from the body, means connected to the front of the body for attachment to a fishing line, means connected to the rear of the body for attachment to a fishing leader, said body having a bulbous semi-spherical front end which tapers down to a relatively small rear end, said wings being disposed rearwardly from the bulbous front end of the body so that said bulbous front end disposes a substantial part of the weight of the sinker forwardly of the wings, the front portion of said wings being larger in area than the rear portions thereof and angled downwardly with respect to the rear portion thereof to cause the sinker to tend to dive when it is drawn through the water, the rear portion of said wings tapering rearwardly from the front portions and being disposed between the top and bottom of the body.

3,940,872
FISHING DEVICE
Russell W. Weber, 8000 W. Bender Road, Milwaukee, Wis. 53218
Filed Mar. 24, 1975, Ser. No. 561,578
Int. Cl.² A01K 95/00
U.S. Cl. 43—43.13 10 Claims



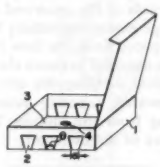
1. In a diving sinker having a flat plate, having means at the rear of said plate for connecting a fish bait thereto, having link means swingably attached to the front of said plate, there being an eye on said link means to which a trolling line can be attached, the improvement comprising an upstanding vertical fin on top of said plate, and an elongated slot having flexible sides located in a forward portion of said fin and extending obliquely rearwardly toward the plate for receiving and detachably holding said link means in a position which causes said plate to extend at an angle to said trolling line, thereby causing said plate to dive as it is drawn through the water.

3,940,873
SHIELD FOR FISH HOOKS AND SIMILAR BARBED HOOK-LIKE MEMBERS
Earl E. Lawless, P.O. Box 472, Georgetown, Calif. 95634
Filed Jan. 17, 1975, Ser. No. 541,824
Int. Cl.² A01K 97/06
U.S. Cl. 43—57.5 R 4 Claims



1. A safeguard hook mitten for releasably embracing a barbed hook-like member, said mitten comprising:
a substantially flat sheet of non-metallic soft flexible material having complementarily configured body portions joined along one edge thereof by an integral fold portion to permit said body portions to be folded along said fold portion to a releasable closed position; and
a pair of complementary hook pad means each secured to the inner facing surface of a different one of said body portions for embracing a barbed portion of said hook-like member and for releasably maintaining said body portions in said closed position.

3,940,874
COCKROACH TRAP
Yoshio Katsuda, Nishinomiya, Japan, assignor to Dainippon Jochugiku Kabushiki Kaisha, Osak, Japan
Filed Sept. 16, 1974, Ser. No. 506,616
Claims priority, application Japan, Sept. 24, 1973, 48-111011[U]; Nov. 30, 1973, 48-138593[U]
Int. Cl.² A01M 1/14
U.S. Cl. 43—114 11 Claims

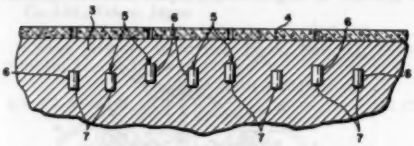


1. A cockroach trap in the form of a box defining therewithin a substantially open space, said box having a base, a layer of adhesive on said base, and side walls made of sheet material surrounding said base, said side walls defining at least one cockroach admitting opening through said sheet material having downwardly converging sides with at least the lower portions of said sides lying at an angle of 30° to 60° with respect to each other and the lower ends of said sides less than 5 mm apart.

3,940,875
METHOD OF TREATING SOIL FOR CONTROLLING TERMITES AND THE LIKE
Mario J. Basile, 8512 Fifth Ave., Brooklyn, N.Y. 11209
Continuation-in-part of Ser. No. 306,933, Nov. 15, 1972, Pat. No. 3,835,578. This application Aug. 9, 1974, Ser. No. 496,363
Int. Cl.² A01M 1/20
U.S. Cl. 43—124 14 Claims

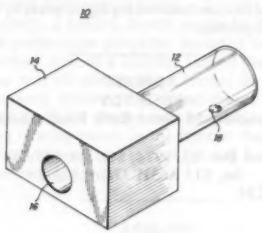
1. The method of providing a signal that subterranean termites are present comprising dispersing in the soil a volatile,

soil penetrating odor forming material enveloped in an imperforate enclosure substantially impermeable to said material, making a portion of said enclosure of a material attractive to



and edible by said termites, placing that portion in the soil so that any termites in the soil adjacent said enclosures would consume said portion and free said odor forming material to produce an odor detectable above the soil surface.

3,940,876
MOUSETRAP
Michael Frank Zaccaira, 123 Cushman Ave., Revere, Mass. 02151
Filed Nov. 1, 1974, Ser. No. 520,130
Int. Cl.² A01M *25/00*
U.S. Cl. 43—131 **2 Claims**



1. A safe animal trap comprising a bait chamber for carrying solid poison bait to attract the animal to be trapped; a hole in said bait chamber sized to admit the animal to be trapped; an access block having at least one flat surface for stably stationing said trap, said block having an elongate passage through it, generally parallel to said surface, for communicating with said hole, said passage proportioned to be significantly longer than it is wide to restrict entry to said chamber, said passage being sufficiently wide to permit movement therethrough of the animal; and means for engaging said access block with said bait chamber.

3,940,877
CONSTRUCTION TOY HAVING STUFFED PARTS OF SOFT MATERIALS
Josephine H. Culkin, 65 Eustis St., Cambridge, Mass. 02140
Filed Aug. 5, 1974, Ser. No. 494,980
Int. Cl.² A63H *33/00*
U.S. Cl. 46—17 **4 Claims**

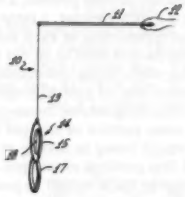
1. A modular, three dimensional toy kit having only relatively soft members for selective assembly and disassembly by small children, said kit comprising:

a. a base member of cloth covering filled with resilient stuffing material and shaped to represent a first portion of a real-world object:

b. a plurality of secondary members of cloth covering filled with resilient stuffing material and shaped to represent second portions of said real-world object; and

c. means for attaching said secondary members to said base member, said means consisting solely of a plurality of loops of cloth material attached to selected points to said base member and integral portions of said secondary members, each said integral portion forming a simulated part of said real-world object, the relative sizes of said loops and said integral portions being such that said secondary members are secured to said base member by insertion of said integral portions through said loops.

3,940,878
WHIRLING TOY
Daniel Panico, 1953-C 19th St., Santa Monica, Calif. 90404
Filed Aug. 19, 1974, Ser. No. 498,385
Int. Cl.² A63H *1/32*
U.S. Cl. 46—47 **9 Claims**



1. A whirling toy, comprising:

an elongated handle having one end portion adapted to be gripped in the hand, and an opposite, free end portion adapted to be moved through rotational and translatory motions;

an elongated flexible driving line of preselected length connected at one end to said free end portion of said handle;

two flat bodies of substantially the same size, shape and weight;

a flexible connecting line substantially shorter than said driving line, said connecting line extending between said bodies and having opposite end portions joined to corresponding peripheral portions of said bodies, thereby joining said bodies together in a whirling assembly;

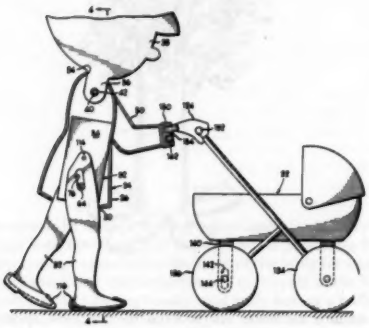
and a double-action swivel means connecting said driving line to said connecting line adjacent one of said bodies, and permitting each of said lines to rotate about its longitudinal axis relative to said swivel means, whereby said whirling assembly may be put into rotation about an axis between said bodies, and generally in a selected plane, by rotation of said free end of said handle, and while rotating, may be variably manipulated with said handle.

3,940,879

WALKING DOLL

Marvin I. Glass, 815 North LaSalle St.; Allison Katzman, 919 West Fullerton Ave., and Peter Aleksa, 6237 South Talman, all of Chicago, Ill.

Filed Dec. 14, 1970, Ser. No. 97,589
Int. Cl. A63h *11/10*
U.S. Cl. 46—102 **4 Claims**



1. A walking mechanism for a toy comprising: first and second legs, each having first and second opposite ends with a surface engaging portion at the first end thereof, a driving portion at the second end thereof and a portion of a pin and slot connection on each leg near the second end and intermediate the first end and the driving portion; a drive mechanism for said legs including a spring motor, a rotary shaft driven by the spring motor and terminating at each end in cranks, said cranks being oriented on said shaft in an out of phase relation with each other and each being connected to the driving portion of a respective one of said legs against lost motion relative to the legs; mounting means, means on said mounting means defining the other portion of said pin and slot connections, said other portions being in mating relation with a respective one of said first portions of said pin and slot connections on said legs whereby each leg will be positively driven by each crank and pivot about the pin and slot connection so that the first end of each leg will move in a walk simulating elongated eliptical path of travel.

3,940,880

DOLL JOINT STRUCTURES

Bette M. Kaelin, and Rouben T. Terzian, both of Chicago, Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

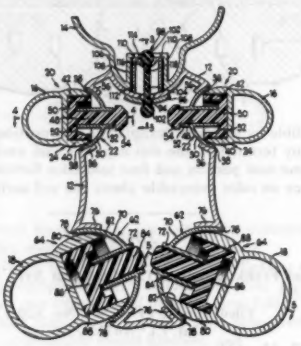
Filed Feb. 13, 1975, Ser. No. 549,755
Int. Cl.[2] A63H *3/46*
U.S. Cl. 46—161 **13 Claims**

1. A joint structure for connecting parts of toy figures or the like, comprising:

a first toy figure part including a rounded portion at said joint, with an opening therein;

a second toy figure part having a complementary rounded portion at said joint; and

connecting means disposed between said first and second toy figure parts at said joint, said connecting means comprising an elongated portion for insertion into the opening of said first toy figure part, means nonflexibly retaining said elongated portion in said opening, and a substantially flexible transverse flange portion on said elongated portion fixedly connected to the rounded portion of said second toy figure part to permit relative movement between said first and second toy figure parts by flexing said transverse portion.

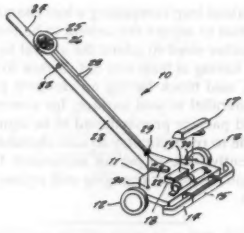


3,940,881

PUSH TOY

Howard L. Drucker, 35 Great Rock Road, Sherborn, Mass. 01770

Filed Dec. 23, 1974, Ser. No. 535,214
Int. Cl.[2] A63H *33/26, 33/02*
U.S. Cl. 46—234 **8 Claims**

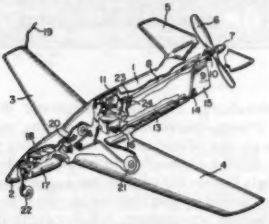


1. In a push toy the combination of a carriage is supported upon a pair of side wheels, said wheels being mounted upon axles in axial alignment with each other and secured to said carriage, a control stick being attached to said carriage at one end, an opposite end of said stick forming a handle for being held in a child's hand, and means for magnetically attaching other toys to said carriage, a front side of said carriage includes a front bumper, said front bumper having an electromagnet built thereinto, said electromagnet being an electrical circuit with a switch and dry cell batteries, said dry cell batteries being carried upon said carriage and enclosed by a removable top cover, said stick is pivotally attached to said carriage by means of a singular pivot pin, a steering wheel secured to a winch being pivotable about a pin secured on said stick, said winch having one end of a pair of nylon cables wound therearound, the opposite ends of said nylon cables extending through an eye bolt secured upon said stick, and the terminal ends of said nylon cables being secured to opposite side areas of said carriage, whereby rotation of said steering wheel causes turning said carriage to right or left.

3,940,882
MOTOR-DRIVEN MODEL AIRPLANE HAVING A PUSHER PROPELLER

Kenichi Mabuchi, Tokyo, Japan, assignor to Mabuchi Motor Co. Ltd., Tokyo, Japan

Filed Nov. 18, 1974, Ser. No. 524,573
Claims priority, application Japan, Nov. 21, 1973, 48-130158; Apr. 1, 1974, 49-37226
Int. Cl.² A63H *27/02*
U.S. Cl. 46—243 AV **12 Claims**



1. A model airplane comprising a fuselage adapted to contain a battery, a battery driven motor having an extension shaft and pusher-type propeller mounted on and driven by said extension shaft at a location behind the tail of said airplane, the rear of said fuselage further including a hollow cylinder-shaped member and a cup-shaped member tightly fixed to said cylinder-shaped member, said cup-shaped member having bearing means in the interior thereof, said extension shaft being permitted to rock on said bearing means and a propeller racing device.

3,940,883
PROCESS FOR THE GROWTH AND PRODUCTION OF MUSHROOM TISSUE

Nobuo Kasahara, Nagoya; Asao Shiota, Kasugai, and Isamu Kitaguchi, Nagoya, all of Japan, assignors to Sanwa Kagaku Kenkyusho Co., Ltd., Nagoya, Japan

Filed Dec. 28, 1973, Ser. No. 429,122
Int. Cl.² A01G *1/04*
U.S. Cl. 47—1.1 **12 Claims**

1. A process for the growth and production of mushroom tissue comprising the steps of providing mushroom tissue of wood rotting fungi, suspending said mushroom tissue in an aqueous nutrient fermentation solution, inoculating said mushroom tissue suspending solution into a prepared mushroom growth and production bed contained in a container under sterilized conditions, ageing said nutrient fermentation solution inoculated bed, cooling the contents of said container, turning said container upside down and subjecting the contents of said container to mushroom growth and production conditions.

3,940,884
MOISTURE RETAINABLE SOIL COVERING WITH INTEGRAL FERTILIZING CAPABILITIES

Stanley I. Mason, Jr., Weston, Conn., assignor to Simco, Inc., Weston, Conn.

Filed Apr. 30, 1974, Ser. No. 465,605
Int. Cl.² A01G *9/00*
U.S. Cl. 47—32 **5 Claims**

1. A universal soil cover for use with plants in different sized containers and being capable of retaining moisture in the soil and dispensing plant-useful material to the soil but permitting the passage of air to the soil including

a sheet of biodegradable cellulostic material capable of retaining water,

a plastic film adhered to the upper surface of said water-retaining sheet,

said film of a type permitting the passage of air therethrough but being repellent to water,

beads of water-soluble plant useful material such as fertilizer or fungicide uniformly secured to the lower surface of said water-retaining sheet, whereby water retained in the sheet will be drawn down into the soil and will carry dissolved water-soluble plant-useful material from the beads into the soil,

opening means in said composite sheet and film to receive a plant stem,

at least one separation line in the composite sheet extending outwardly from the stem opening to permit the composite sheet to be placed around a plant stem, and

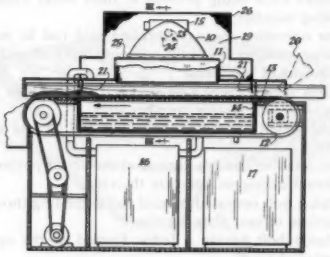
a plurality of rows of spaced perforations in said composite sheet and film adapted to permit ready tearing away of outer portion of said cover to reduce it to a size conforming to a container holding said plant,

whereby said cover may surround the stem of a plant in a container to retain moisture and dispense plant-useful material therein without preventing aeration of the plant's root structure.

3,940,885
PROCESS AND EQUIPMENT FOR TREATING SEEDS AND PRODUCT THEREOF

Oscar Sam Gray, 2503 Lincoln Ave., Evansville, Ind. 47700

Filed Jan. 21, 1975, Ser. No. 542,775
Int. Cl.² A01C *1/00*
U.S. Cl. 47—58 **6 Claims**



3. That process for stimulating growth and productive yield of seeds and maintaining such stimulus over a protracted time interval which comprises, first, subjecting the seeds to concentrated microwave energy in a range of from 890 to 18,000 megahertz, with the amperage ranging from 180–740 milliamps, for from 1 to 25 seconds in a temperature controlled atmosphere of from 40° to 70°F., then subjecting said seeds to a partial vacuum of from 15 to 25 inches of mercury, absolute, for from 3 to 10 minutes.

3,940,886

PANIC EXIT DOOR LOCKING STRUCTURE

Chester W. Ellingson, Jr., Burnsville, Minn., assignor to American Device Manufacturing Company, Steeleville, Ill.

Continuation of Ser. No. 321,141, Jan. 5, 1973, abandoned. This application July 5, 1974, Ser. No. 485,768
Int. Cl.[2] E06B 7/20; E05B 65/10; E05C 15/02
U.S. Cl. 49—319 5 Claims

1. A door locking structure forming a panic exit device having in combination

an elongated housing formed as an open-sided channel,

an operating rod disposed longitudinally in said channel,

a sealing member in said channel in spaced relation to said rod and movable inwardly and outwardly of said channel,

a plurality of vertically spaced links pivoted in said channel intermediate their ends,

said links each being pivoted at one end to said rod,

said links each being pivoted at their other ends to said sealing member,

a door operating means operating said rod to move said sealing member inwardly and outwardly of said channel by means of said links,

deadlock means carried by said rod in operative relationship with said sealing member,

a latching bolt carried at the upper end of said operating rod,

a plate member slidably carried at the upper portion of said channel having an aperture therein,

said latch bolt operated by said rod extending through said aperture of said plate member,

said latch bolt having a ledge formed in the upper end portion thereof,

a spring member normally urging said plate member to overlie said ledge of said latch bolt to retain said latch bolt in retracted position,

said plate member having a portion extending outwardly of said channel,

a door frame receiving said housing in a door closing position, and

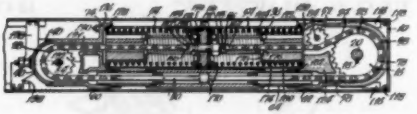
said extended portion of said plate member engaging said door frame and yielding to said engagement to release said latch bolt to have the same extend therethrough to latching position.

3,940,887

HYDRAULICALLY CONTROLLED PNEUMATIC SWINGING DOOR OPERATOR

Loren E. Slaybaugh, Arlington Heights, Ill., assignor to Republic Industries, Inc., Chicago, Ill.

Filed Nov. 18, 1974, Ser. No. 524,611
Int. Cl.[2] E05F 15/02
U.S. Cl. 49—137 1 Claim



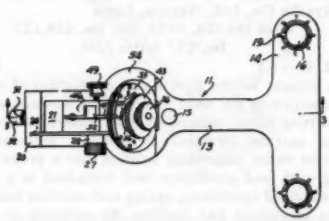
1. A hydraulically controlled pneumatic door operator comprising a loop, spaced means supporting said loop at its ends for travel, one of said spaced means being rotatable and adapted for driving connection to a swinging door, said loop being drivingly connected to said one spaced means, a pneumatic piston carried by said loop on one side thereof between said spaced means, a pneumatic cylinder enclosing said pneumatic piston and including resilient means comprising caged springs on each side of said piston to normally position said piston centrally within said cylinder corresponding to door closed position, a hydraulic piston carried by said loop on the other side thereof between said spaced means, a hydraulic cylinder enclosing said hydraulic piston in normally central position, means defining passages for permitting controlled liquid flow from one side of said hydraulic piston to the other in said hydraulic cylinder and means for admitting air under pressure to said pneumatic cylinder to move said piston.

3,940,888

FACETING DEVICE FOR GEMSTONES

Harry C. Wain, Stafford Industrial Park P.O. Box 84, Stafford Springs, Conn. 06076

Filed Jan. 31, 1975, Ser. No. 545,878
Int. Cl.[2] B24B 19/00
U.S. Cl. 51—229 7 Claims



1. A gemstone faceting holder comprising a support, an angularly adjustable bracket member on said support provided with angle-indicating means, a sleeve member rotatably mounted in said bracket member, dop stick means secured in said sleeve member, a peripherally toothed indexing gear secured on said sleeve member, a spring-biased trigger lever pivoted on said bracket member and being engageable with the toothed periphery of the gear to fix the position of said dop stick means, an indexing wheel rotatably mounted on the sleeve member and having evenly spaced peripheral guide notches for the trigger lever, interengaging locking means on the wheel and gear to interlock the wheel and gear in a plurality of different angular relations to each other, said interengageable locking means including a projection on the gear and angularly spaced receiving socket means on the wheel for receiving said projection at said different angular relations between the wheel and gear, and spring means urging the

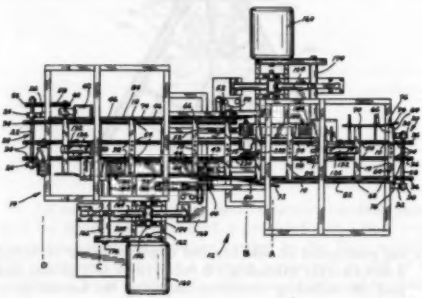
wheel into interlocking relation with the gear, the wheel being disengageable from the gear by lifting movement axially of the sleeve member against the bias of said spring means to vary the angular relation of the wheel and gear.

3,940,889

METHOD FOR SHARPENING ROTARY BLADES

Harland R. Hedlund, and Harry K. Wethe, both of St. Paul, Minn., assignors to Aladdin Manufacturing Company, Minneapolis, Minn.

Filed May 5, 1975, Ser. No. 574,507
Int. Cl.² B24B *1/00, 3/60*
U.S. Cl. 51—288 **2 Claims**



1. A method of sharpening a relatively flat, elongated, double ended rotary cutting blade using a belt sander having an abrasive grinder belt running over and rotating with a contact wheel, and using a rotating abrasive member having flexible abrasive elements extending outwardly therefrom, including the steps of:

A. bringing a moving abrasive belt backed by a rotating contact wheel of a belt sander into operational grinding relation to a longitudinally extending leading edge portion of a first end of a relatively flat, double ended rotary cutting blade to achieve a first sharpened cutting edge;

B. bringing such an abrasive belt backed by such a contact wheel into operational grinding relation to a longitudinally extending trailing edge portion of a second end of said blade to achieve a second sharpened cutting edge substantially identical to and opposite from said first edge;

C. removing burrs raised in the grinding steps by bringing said longitudinally extending leading edge portion at the first end of such blade and said longitudinally extending trailing edge portion at the second end of said blade each into operational abrading relationship to a rotating abrasive member having flexible abrasive elements extending outwardly thereof at position adjacent first and second cutting edges.

3,940,890

MODULAR ACCOMMODATION SYSTEM

William F. Postlethwaite, New York, N.Y., assignor to Skycell Corporation, North Marshfield, Mass.

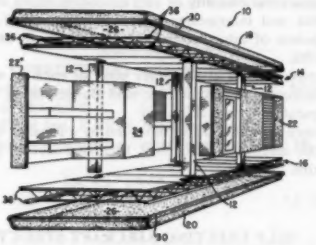
Filed Sept. 24, 1974, Ser. No. 508,909
Int. Cl.² E04H *1/12*
U.S. Cl. 52—79 **2 Claims**

1. A module for use in a modular housing system comprising:

upper and lower shell members having identical rectangular, trough-shaped configurations;

upper and lower trusses, each truss including vertically spaced, parallel joists having web members extending therebetween each truss nesting within a respective shell member and fixed therein, a space being formed between the peripheries of the trusses and respective shell members defining peripheral channels;

vertical wall sections extending between the upper and lower shell members, the upper and lower edges of the wall sections being located within the peripheral channels; and



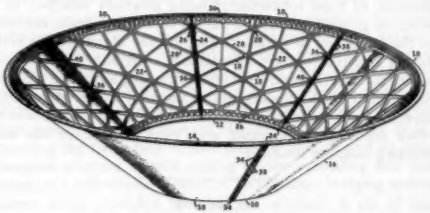
an assembly of vertical structural columns each column having its upper and lower end portion connected to the upper and lower trusses respectively so that the entire load of said shell assemblies is transmitted through said columns, the wall sections being essentially free of load, the columns of said column assembly being arranged substantially symmetrically about a vertical plane disposed at a 45° angle relative to the longitudinal axis of said module.

3,940,891

CONICAL STRUCTURE

Paul Slysh, San Diego, Calif., assignor to General Dynamics Corporation, San Diego, Calif.

Filed Aug. 5, 1974, Ser. No. 495,029
Int. Cl.² E04C *2/38*
U.S. Cl. 52—82 **9 Claims**



1. A high strength conical structure comprising:

at least one skin sheet configured as a section of a conical surface;

a first plurality of upstanding ribs of substantially equal height extending away from said skin sheet and integral therewith;

said first plurality of ribs configured in evenly spaced alternately right and left spirals said right and left spirals being defined by the equasion

$$R_2 = R_1 \exp\left(\frac{\pi\theta}{6}\right)$$

wherein R_1 and R_2 are radii from the cone apex to selected points 1 and 2 on the spiral and θ is the angle at the cone apex between the radii vectors R_1 and R_2 in radians.

a second plurality of upstanding ribs of substantially even height with said first plurality of ribs extending away from said skin sheet and integral therewith;

said second plurality of ribs extending along conic generatrix and intersecting said first plurality of ribs only at points of intersection and between right and left spiral ribs;

narrow flanges at the inner edge of each of said first and second plurality of ribs, said flanges being substantially parallel to said skin; and

a circular node pocket bounded by a circular flanged rib at the intersections of said first and second pluralities of ribs.

3,940,892

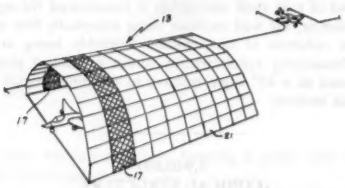
SELF-ERECTING AIRCRAFT STRUCTURE

Charles Lindbergh, Hqs. USAFE-DE-POB 8155 APO, New York, N.Y. 09012

Filed May 23, 1974, Ser. No. 472,927

Int. Cl.² E04B *1/32*

U.S. Cl. 52—86 **2 Claims**



1. A self-erecting structure for use in the storage of aircraft and the like, said structure comprising a series of bay arches in a row forming a building structure, each of said arches including a plurality of truss subelements in side-by-side relationship, each of said truss subelements being hingedly connected to the next adjacent truss subelement, one end of said plurality of truss subelements being pivotally attached to a point on ground level and a pair of rotatable wheels attached to the other end to permit rolling motion along ground level during relative rotation of adjacent truss subelements, and means for erecting said structure by causing a relative rotation of adjacent truss subelements to increase the relative angle therebetween thereby forming an arch bay for attachment to other similarly configurated arch bays to produce the self-erecting building structure.

3,940,893

BUILDING PANEL JOINT

Donald L. Rausch, Cedar Falls, and Donald A. Jacque, Dunkerton, both of Iowa, assignors to R-J Industries, Inc., Waverly, Iowa

Filed Feb. 22, 1974, Ser. No. 444,746

Int. Cl.² E04B *1/68*

U.S. Cl. 52—90 **1 Claim**

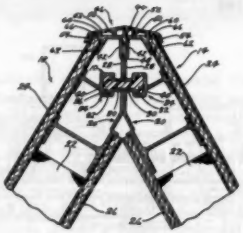
1. An A-frame roof structure structural joint comprising,

a pair of upstanding roof panels positioned to form an A and having abutting vertically disposed surfaces at their apex, said vertical surfaces having aligned horizontal slots which connect with enlarged cavities to form an I-shaped passageway,

an I-shaped connecting element slidably positioned in the I-shaped passageway for detachably locking said panels together,

said abutting faces including spaced apart portions above said I-shaped passageway which form a groove which opens upwardly, said groove having sidewalls including serrations,

said panels having top end edges which are horizontal and flat and merge with said groove and with said outer surfaces on said panels extending downwardly and outwardly,



a cap positioned on said top end edges, said cap including a downwardly extending rib received in said groove and said rib including serrations engaging the serrations of said groove sidewalls,

said cap having a horizontal portion including wing portions on opposite sides of said rib and said wing portions slope downwardly and outwardly to the outside surfaces of said panels where said wings merge into sidewall portions which extend downwardly along said outside surfaces of said panels and

downwardly extending shoulder means are provided on said cap on opposite sides of said rib and engage the top end edges of said panel to limit movement of said wing portions towards said panel end edges.

3,940,894

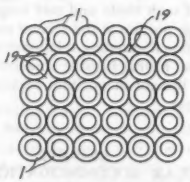
BURIAL MEANS AND THE LIKE

Abner H. Nunes, 1854 Mahana St., Honolulu, Hawaii 96816

Filed Mar. 10, 1971, Ser. No. 122,780

Int. Cl.² A47G *29/00;* **E04H** *13/00*

U.S. Cl. 52—129 **6 Claims**



1. The burial means comprising an elongated capsule having one open end is included for receiving the body of a deceased, a removable top end closure means in the open end of the capsule, and a bore through the top closure means for exhausting air in the capsule and/or injecting an embalming fluid into the capsule, wherein the top end of the capsule is provided with a plurality of laterally oriented bores and the closure means is provided with a plurality of similar laterally oriented bores, and pegs driven into the said bores when aligned for securing the closure means to the capsule in shear force across the pegs.

3,940,895
EARTHQUAKE ISOLATING AND VIBRATION ABSORBING EQUIPMENT FOR STRUCTURES

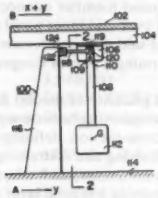
Shizuo Yamamoto; Yuichi Nagai, both of Tokyo; Nobuyuki Shimizu, Yokohama, and Hiroshi Tajimi, Tokyo, all of Japan, assignors to Chiyoda Chemical Engineering & Construction Co. Ltd., Yokohama, Japan

Filed Aug. 9, 1974, Ser. No. 496,216

Claims priority, application Japan, Aug. 10, 1973, 48-89339; July 13, 1974, 49-79738; July 11, 1974, 49-78687; July 13, 1974, 49-82245[U]; July 13, 1974, 49-82246[U]

Int. Cl.² E04H *9/02*

U.S. Cl. 52—167 **16 Claims**



1. An earthquake isolating and vibration absorbing equipment for structures which each is provided with a floor member and a supported member carried by the floor member, said equipment including a hanger connected to one of the members, a lever normally positioned vertically and pivoted to the hanger at a pivotal point in one end portion of the lever, a weight member mounted on the other end portion of the lever, a holder secured to the other of said members, an arm member having one end pivoted to a free end portion of the holder and the other end pivoted to a portion of the lever other than the pivotal point, said arm member extending horizontally so as to be parallel with the supported member and the floor member, and the weight member being adapted to swing to produce an inertia which applies to, and along the arm member through the lever, a force resisting against, and reducing the horizontal movement of the supported member resulting from an earthquake and for vibration of the floor member.

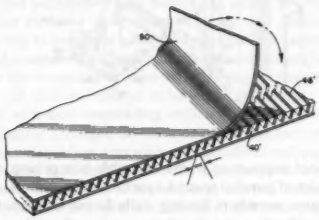
3,940,896
SOLAR RADIATION AND GLARE SCREEN AND METHOD OF MAKING SAME

John F. Steel, 1469 N. Ocean Blvd., Palm Beach, Fla. 33480

Filed Nov. 21, 1973, Ser. No. 417,914

Int. Cl.² F21V *13/04*

U.S. Cl. 52—307 **6 Claims**



1. A louvered screen comprising a carrier body formed of transparent sheet material whose upper and lower surfaces substantially are continuous and throughout equidistantly spaced apart; and a plurality of opaque louver means disposed in and supported substantially stationarily by said carrier body, each of said louver means formed from at least two separate segments of material each having a substantially planar rectangular outline and a major and minor axis, said segments being positioned in the carrier body in a spaced apart discontinuous manner along their major axis, the space between said segments having nothing to impede vision through the carrier body; said louver means being spaced from adjacent louver means along a second dimension of said carrier body which is normal to said first dimension, each of said louver means being disposed at an angle acute to a plane normal to the surface of said carrier body, and each louver means and having a thickness greater than the product of the length of the minor axis of said louver means times the cosine of the angle of disposition so that each said louver means is embedded within said carrier body.

3,940,897
STRUCTURAL ASSEMBLIES

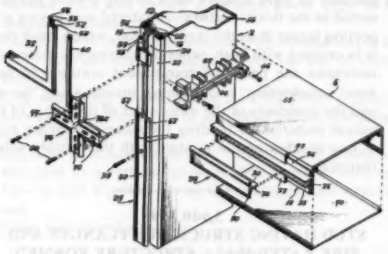
Richard Lewis Stoakes, "Clouds" Northdown Rd., Woldingham, Surrey, England

Filed Jan. 2, 1974, Ser. No. 430,036

Claims priority, application United Kingdom, Jan. 10, 1973, 1285/73

Int. Cl.² E04B *2/88*

U.S. Cl. 52—395 **12 Claims**



1. A structural assembly comprising, in combination, a frame structure, a series of rigid elongate members being attached together to form said structure and at least two contiguous spaces being defined by the elongate member in the structure to receive infill elements, and means making a seal between the members of each each infill element, said means comprising a flexible sealing device for each said space in the form of a closed loop of a strip-like material engaging the infill element at the periphery of the space, auxiliary rigid frame elements secured to the elongate members clamping said sealing devices in place, at least at the common boundary between each contiguous pair of said spaces, said auxiliary elements comprising forward portions projecting laterally oppositely away from a central portion, a recess being provided between the front faces of the forward portions and each forward portion having a respective flexible sealing device mounted on it, a forward element of said sealing device covering the front face of said forward portion and an inner marginal element of said sealing device extending into said recess in a self-retaining manner, and further, bridging sealing means being provided between the adjacent edges of said inner marginal elements of the respective sealing devices in said recess and lockingly securing the sealing devices in the recess.

3,940,898
DOUBLE-PANE WINDOW CONTAINING DRY ATMOSPHERE AND METHOD FOR PRODUCING SAME

Albert N. Kaufman, Indianapolis, Ind., assignor to K.T. Corporation, Shelbyville, Ind.

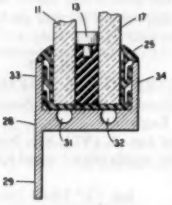
Filed Aug. 20, 1973, Ser. No. 390,113

Int. Cl.² E06B *3/64, 3/24*

U.S. Cl. 52—400 **8 Claims**

1. A double-pane window having a dry atmosphere comprising:

a first pane of transparent material;
a second pane of transparent material essentially parallel with the first pane;
a strip of flexible adhesive material disposed along the periphery of the adjacent sides of the panes of transparent material in sealing engagement with the panes enclosing a sealed area between the panes;
a dry gas within the sealed area between the panes;

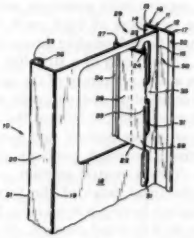


a plurality of rigid spacers each having a stem portion inserted in the flexible adhesive material and having a head portion larger than the stem portion, which head portion is in contact with both panes of transparent material and maintains the panes of transparent material in spaced apart relationship; and framing means along the edges and the periphery of the outer sides of the panes of transparent material for holding the panes stationary relative to one another and in contact with the flexible adhesive material.

3,940,899
STUD HAVING STRUCK-OUT FLANGES AND FIRE-RATED WALL STRUCTURE FORMED THEREWITH

Henry A. Balinski, Hoffman Estates, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed May 27, 1975, Ser. No. 580,994
Int. Cl.[2] E04B 2/30, 2/78
U.S. Cl. 52—481 **19 Claims**



1. A stud adapted for use in constructing a wall comprised of a pair of spaced-apart coplanar layers of gypsum wallboard panels in abutting relationship having a plurality of said studs interposed between said layers of wallboard panels and affixed thereto, said stud being formed of a unitary integral sheet metal structure and comprising:

A. A first wallboard panel layer-engaging structure comprising:

1. a first flange-forming panel comprising
   a. an outer panel member extending to a first fold, and
   b. an inner panel member connected at said first fold and folded over a surface of said outer panel member and extending to a second fold intermediate the edges of said outer panel member, thereby forming a pair of flanges one on each side of said second fold,
2. a web connected at said second fold and extending away from said first flange-forming panel, disposed substantially perpendicular thereto and extending to a third fold, and
3. a plurality of discrete longitudinally spaced-apart second flange-forming panels each formed of a single tab struck from a medial portion of said web and positioned substantially parallel with respect to said first flange-forming panel, each of said discrete panels comprising;
   a. an inner panel member connected to said web at a fourth fold and disposed substantially perpendicular to said web and extending to a fifth fold, and
   b. an outer panel member connected at said fifth fold and folded over said inner panel member and extending beyond said web and terminating at a free edge, thereby forming a pair of flanges one on each side of said web,

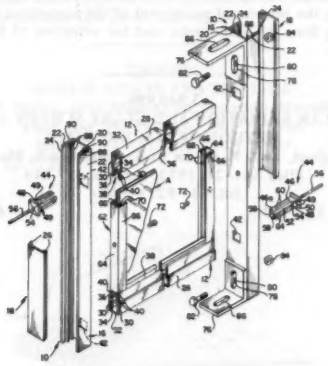
said first and said plurality of second flange-forming panels and said web cooperating to form a plurality of H-shaped structures in cross-section defining oppositely directed channels for receiving and restraining adjacent wallboard panels in three directions; and

B. means for supporting a second layer of gypsum wallboard panels spaced apart from said first layer of panels comprising a wallboard-supporting panel connected at said third fold extending in a direction substantially parallel to and spaced-apart from said first flange-forming panel and adapted to permit said second layer of panels to extend across and be affixed to the outer surface of said supporting panel.

3,940,900
PANEL SUPPORTING FRAME ASSEMBLY

Adolph D. Russo, Beachwood, Ohio, assignor to Russo Ornamental Iron Products, Inc., Bedford Heights, Ohio

Filed Nov. 20, 1974, Ser. No. 525,393
Int. Cl.[2] E04C 2/38
U.S. Cl. 52—656 **13 Claims**



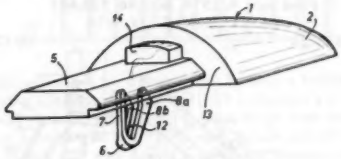
1. A panel supporting frame assembly comprising, first and second pairs of parallel spaced apart frame members, said first pair of frame members having walls facing one another and provided with aligned polygonal openings therethrough, said second pair of frame members being extruded metal members having opposite ends juxtaposed with respect to said walls and provided with polygonal openings thereinto aligned with said openings through said walls, expandable fastener means extending through said openings in said walls and into the openings in the ends of said second pair of frame members, each of said second pair of frame members including a pair of longitudinally extending laterally spaced apart flanges integral therewith and defining a panel edge receiving recess therefor,

said recesses of said second pair of frame members opening toward one another and being spaced apart to receive and support a panel therebetween, said fastener means having first portions in said wall openings, second portions in said second member openings and means engaging said walls to axially position said first and second portions in said openings, said first and second portions being of complementary polygonal cross-section and dimension with respect to the corresponding wall and second member openings, said second portion of each said fastener means including a plurality of legs in the corresponding second member opening, and each said fastener means further including wedge means engaging and spreading said legs radially against said corresponding second member opening.

3,940,901
EXTREMITIES OF DECORATIVE MOULDINGS

André Nivet, Beauchamp, France, assignor to ITW de France, Beauchamp, France

Filed Feb. 6, 1975, Ser. No. 547,520
Claims priority, application France, Feb. 7, 1974, 74.05174
Int. Cl.² E04C 2/38
U.S. Cl. 52—717 5 Claims

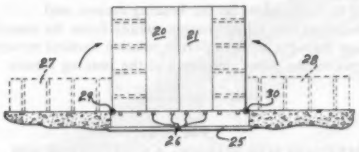


1. A one-piece plastic device forming an extremity for an internally hollowed decorated molding mounted on a support and comprising: a head having two portions, the first portion of which constitutes the finish of the molding at one of its extremities while the second portion constitutes the reception member for retaining the extremity of the molding, said second portion having at least partly a shape complementary to the longitudinal inner face of the hollow molding and having means for fixing said molding on said second portion, said first and second portions of said head lying along the longitudinal axis of the molding to be retained, these two portions of said head having in common a flat face applicable against the outer face of the support; a clip for fixing the second portion of said head on the cooperative support, said support constituted by a panel of predetermined substantially constant thickness provided with a corresponding orifice for the reception of said clip, this latter arranged on the side of the flat face of the head and comprising a first arm with a longitudinal axis perpendicular to the flat face common to the two portions of said head and at least one resilient second arm curved back from the extremity of said first arm and directed towards said flat face common to the two portions of said head and on the side of the first portion of the head, both of said arms forming the clip lying in a plane substantially parallel to the longitudinal axis of the molding to be retained, said second arm having an extremity for complimentary cooperation with the lateral wall of the orifice closest to the end of the molding to be retained while the outer face of said first arm cooperates with the diametrically-opposite lateral wall of the passage orifice, the curved portion separating the first and second branches of said clip constituting an elastically flexible hinge.

3,940,902
FULCRUM TILT BUILDING SYSTEM

Lucio V. Reale, 1311 Grenade St., Chambly, Quebec, Canada

Filed Apr. 1, 1974, Ser. No. 457,082
Int. Cl.² E04G 21/00
U.S. Cl. 52—745 7 Claims



1. A method of constructing a building comprising the steps of:

forming at least one multicellular, monolithic structure on a horizontal plane, the formed structure having only vertical walls and having a forward lower edge in said horizontal plane;

providing a V-notch in the horizontal plane adjacent to said lower forward edge of said structure but out of contact therewith;

sliding and tilting said structure forward about said lower forward edge thereof until said edge enters and rests in said V-notch;

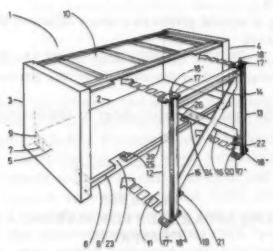
tilting said structure about said V-notch, and raising said structure to a vertical location, said lower forward edge leaving said V-notch during the raising of said structure; and

leveling said raised structure.

3,940,903
PREFABRICATED TRANSPORTABLE ROOM ELEMENT FOR USE IN THE CONSTRUCTION OF A PLURAL STOREY BUILDING

Dietrich Gunkel, Constance, Germany, assignor to Credelca A.G., Zug, Switzerland

Filed Apr. 25, 1974, Ser. No. 464,245
Claims priority, application Switzerland, Apr. 25, 1973, 5949/73
Int. Cl.² E04G 21/00
U.S. Cl. 52—745 6 Claims



1. A method of constructing a plural storey building, the method comprising:

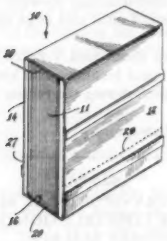
a. taking a plurality of prefabricated transportable room elements each comprising a floor panel structure and at least one vertical load-bearing structure extending upwardly of the floor panel structure and each having bracing means releasably connected thereto, the room element and the bracing means each having buttressing surfaces,

b. stacking the room elements one upon another on a foundation with the bracing means of the room elements vertically aligned,
c. connecting the bracing means of the lowermost room element to the foundation and the bracing means of the plurality of room elements to one another,
d. ensuring that the buttressing surfaces of each room element and its associated bracing means are in co-operating engagement so that horizontal loads on the room element will be transmitted to the bracing means, and
e. disconnecting each bracing means from its associated room element so as to permit relative vertical movement between the room element and the bracing means.

3,940,904
METHOD FOR MAKING A COVERED BOOK

John V. McGuire, Deerfield, and Robert L. Mitchell, Libertyville, both of Ill., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 27, 1975, Ser. No. 562,623
Int. Cl.² B65B *13/02*
U.S. Cl. 53—3 **6 Claims**



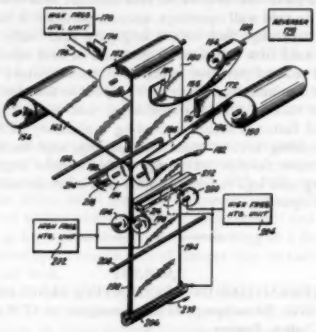
1. A method for manufacturing a book having a security cover, comprising the steps of:
a. aligning a stack of sheets to provide an edge surface;
b. locating a first protective sheet adjacent the first sheet of the stack;
c. locating a second protective sheet adjacent the last sheet of the stack;
d. fixing an adhesive binding strip to the sheets along said edge surface and to the outside of the protective sheets; and
e. fixing the first protective sheet to the second protective sheet.

3,940,905
METHOD AND APPARATUS FOR MAKING A THERMAL COMPRESS

Thomas William Perry, 3rd, 474 Princeton Ave., Brick Town, N.J. 08723

Division of Ser. No. 373,436, July 25, 1973, Pat. No. 3,865,117. This application Aug. 2, 1974, Ser. No. 494,309
Int. Cl.² B65B *9/02, 61/18*
U.S. Cl. 53—14 **8 Claims**

1. A method of making a thermal compress comprising sandwiching a wall between two sheets and connecting the sheets to the wall along a closed line to form separate compartments, sealing a tear strip between said wall and one of said sheets, bending said wall and sheets as well as said tear strip transversely of the latter and, before the tear strip is sealed between said wall and said one sheet, at least partly

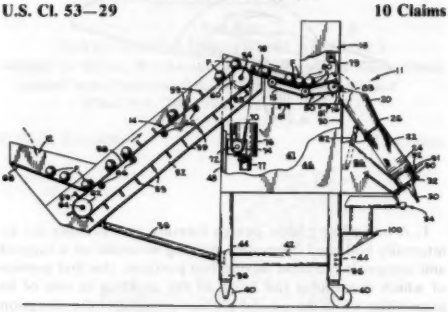


straightening the tear strip to decrease the effective length thereof relative to that of said wall and sheets.

3,940,906
METHOD OF AND APPARATUS FOR FORMING PACKAGES

Lee M. Leckband, and Steven W. Taatjes, both of Lindsay, Calif., assignors to FMC Corporation, San Jose, Calif.

Filed Nov. 4, 1974, Ser. No. 520,681
Int. Cl.² B65B *57/14, 9/16*
U.S. Cl. 53—29 **10 Claims**



7. A method of forming a package comprised of articles wrapped in a hose-shaped wrapper, said method comprising the steps of providing a generally vertically oriented forming tube and a supply of hose-shaped wrapping material pleated axially and fitting telescopically about the outer surface of the tube with a portion of the wrapping material extending over the upper rim of the tube and downwardly through the tube bore to a position below the lower rim of the tube; gathering the end of the wrapping material together and applying a fastener thereto; filling the portion of wrapping material inside the tube bore with a quantity of articles to be packaged while supporting the wrapping material and the accumulated articles at a position directly below the tube; removing the support from the wrapping material and accumulated articles upon completion of the filling operation to drop at least some of the articles in the wrapping material from the position of support downwardly to the fastened end of the wrapping material thereby causing a downward pull on the wrapping material to break up any bridging of any other articles in the tube so that all of the articles pass downwardly through the tube bore to a position therebelow and another portion of hose-shaped wrapping material is fed into the internal bore for the reception of the next batch of articles to be packaged; returning the support to a position below the tube for supporting said next batch of articles; and severing the wrapping

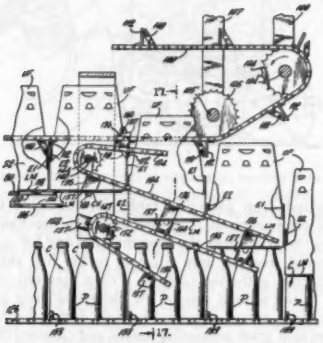
material at a location located laterally of the line of fall from the lower rim of the forming tube by a distance sufficient for the support to be moved to an article supporting position, said material being severed above said quantity of articles to be packaged.

3,940,907

BOTTLE PACKAGING MACHINE

Robert H. Ganz, Saddle River, N.J., assignor to Federal Paper Board Company, Inc., Montvale, N.J.

Filed May 15, 1974, Ser. No. 470,036
Int. Cl.[2] B65B 21/22
U.S. Cl. 53—48 23 Claims



1. An apparatus for opening and loading a folded tubular packaging container of the type which comprises a plurality of side wall panels connected on parallel hinge lines and having top and bottom wall forming closure panels extending in the plane of the side wall panels and hinged thereto, said container being adapted to be unfolded by hinging in opposite directions the side wall panels on hinge lines at opposite ends of the container, said apparatus comprising means for advancing successive folded containers in a generally horizontal plane and along a predetermined path with the hinge lines which connect the side wall panels extending transversely of the direction of travel, means forming a panel confining channel extending along one side of said container advancing means, means for turning a bottom wall forming panel on each successive container downwardly into a generally vertical plane and guiding the same into said panel confining channel, means for hinging said container about the panel which is confined in said channel so as to position said container in a generally vertical plane along said one side of said container advancing means with the unconfined panels free to pivot on said connecting hinge lines and to move a predetermined distance outwardly relative to said confined panel, means to move said unconfined panels outwardly thereby to open up said container into tubular condition, means to advance said opened up container to an assembly station, means to advance to said assembly station one or more articles to be loaded into said container and means to align the container vertically with said articles and to guide the container down onto the articles so as to load the container.

3,940,908

NUCLEAR FUEL PELLET LOADING MACHINE

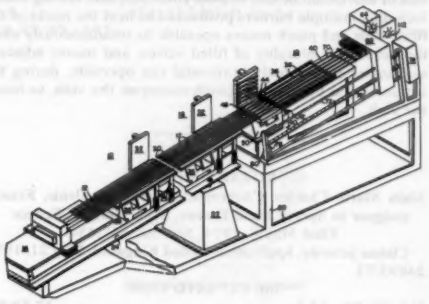
John R. Dazen, Cheswick, and John V. Denero, Leechburg, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 13, 1972, Ser. No. 262,377
Int. Cl. B65b 57/10
U.S. Cl. 53—59 R 15 Claims

1. A machine for loading fuel pellets into fuel rods to be used in a nuclear reactor comprising:

a base supporting a rack arranged to hold a multiplicity of fuel rods in a stationary position;

means on the base in longitudinal alignment with said rack for holding multiple columns of fuel pellets respectively corresponding to the number of fuel rods;



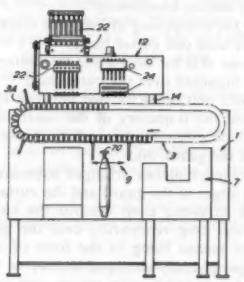
said means and said rack being inclined at an angle to the horizontal; and a power driven device on said base having members arranged to contact said columns of fuel pellets to feed said pellets into said fuel rods.

3,940,909

MACHINE FOR FILLING AND SEALING GLASS VIALS STARTING FROM CLOSED VIALS

Elisabetta Cioni; Lucia Cioni, and Rovena Anichini Cioni, all of Via di Marciano 22, Siena, Italy (I-53100)

Filed Aug. 16, 1974, Ser. No. 498,174
Claims priority, application Italy, Aug. 21, 1973, 9593/73
Int. Cl.[2] B65B 7/16
U.S. Cl. 53—167 8 Claims



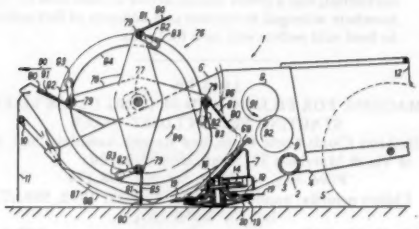
1. A machine for filling in and sealing glass vials comprising, in combination, a frame; endless conveyor means mounted on said frame, and including an endless conveyor having an upper substantially horizontal run and a lower substantially horizontal run; receptacle secured to said conveyor and arranged to frictionally receive vertically oriented vials; driving means operable to drive said conveyor means; indexing means operable to index the conveyor means during each cycle of operation; means, at a station adjacent said lower substantially horizontal run, operable to supply a plurality of closed empty vials to said conveyor means by displacing the vials, in inverted relation, into said receptacles from beneath said lower substantially horizontal run; engraving means disposed at a station adjacent said lower substantially horizontal run of said conveyor means and operable to engrave a fracturing mark on the neck of each vial mounted in inverted relation in a receptacle; fracturing means adjacent said lower substantially horizontal run, downstream of said engraving means in the direction of movement of said endless conveyor, operable to frac-

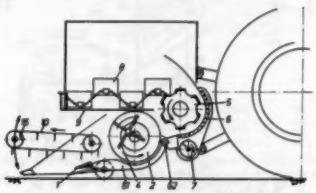
ture the necks of the vials at said fracturing marks; filling means at a station adjacent said upper substantially horizontal run and operable to fill the now upright vials having open necks; sealing means adjacent said upper substantially horizontal run and downstream of said filling means in the direction of movement of said endless conveyor, said sealing means including multiple burners positioned to heat the necks of the filled vials and pinch means operable to simultaneously close the necks of a plurality of filled valves; and means adjacent said upper substantially horizontal run operable, during the action of said burners and pinch means on the vials, to rotate the vials.

3,940,910
ROTARY MOWER

Alain Marie Charles d'Acremont, Morey St. Denis, France, assignor to Sperry Rand France, S.A., Longvic, France

Filed May 6, 1974, Ser. No. 467,434
Claims priority, application United Kingdom, May 21, 1973, 24093/73
Int. Cl.² A01D *43/00*
U.S. Cl. 56—14.4 **17 Claims**





3. A rotary mower comprising:

a. a cutter bar comprising at least one rotatable cutter unit having at least one cutter blade;

b. a least one skid for supporting the cutter bar;

c. a guard mounted over the cutter bar;

d. said cutter unit being located between the skid and the guard and the trajectory of the outermost end of each cutter blade extending beyond the forward edges of the skid and the guard; and

e. crop conveyor means arranged substantially above the forward edges of the guard and the cutter bar and being operable to sweep crop towards the cutter bar and to convey cut crop rearwardly over the guard, said crop conveyor means being in the form of a reel structure having peripherally-arranged transverse slats supporting tines and actuated by cam means, said cam means being operable angularly to adjust the slats, and hence the position of the tines, such that the tines positively engage the crop forwardly of the cutter bar, feed it to the cutter bar for cutting, then convey the cut crop in a rearward direction over the guard immediately after being cut, and finally release the cut crop.

3,940,911
HARVESTERS

Helwig Schmitt, 3523 Raiffeisenstrasse 5, 3523 Grebenstein, near Kassel, Germany

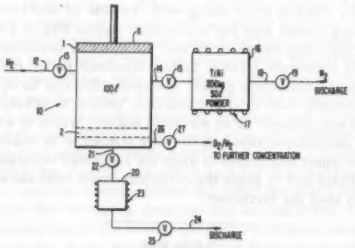
Filed Apr. 4, 1974, Ser. No. 457,736
Claims priority, application Germany, Apr. 5, 1973, 2317048
Int. Cl.² A01D *41/06*
U.S. Cl. 56—14.6 **6 Claims**

1. A crop harvesting machine including a frame; an elongated crop gathering table mounted on the frame with an open front for receiving crop material and a first and second side at opposite ends of said open front; a conveyor mounted on the elongated crop gathering table for conveying crop material toward said first side and away from said second side of the elongated crop gathering table; a crop threshing mechanism including a cylinder and concave mounted on said frame adjacent to the first side of the elongated crop gathering table, for receiving crop material from the conveyor mounted on the elongated crop gathering table and threshing the crop material; grain separating means mounted on the frame of the crop harvesting machine directly above at least a portion of the elongated crop gathering table and the conveyor mounted on the elongated crop gathering table, for receiving threshed grain and crop material from the threshing mechanism, for separating the grain from the crop material and for conveying crop material from an area adjacent to the first side of the elongated crop gathering table to a crop material discharge adjacent to the second side of the elongated crop gathering table; cleaning means mounted on said frame for receiving grain from said grain separating means and cleaning the grain; a clean grain conveyor mounted on said frame for conveying grain away from the cleaning means; and attaching means mounted on said frame for attaching the crop harvesting machine to a vehicle.

3,940,912
METHOD FOR PREPARATION OF DEUTERIUM BY ISOTOPE SEPARATION

Helmut Buchner, Wendlingen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Feb. 14, 1974, Ser. No. 442,638
Claims priority, application Germany, Feb. 14, 1973, 2307180
Int. Cl.² B01D *53/22*
U.S. Cl. 55—16 **24 Claims**



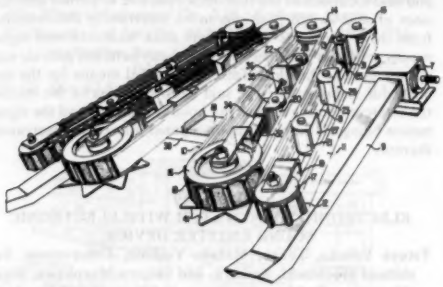
1. A method for separating deuterium and hydrogen, comprising the steps of bringing into contact a gaseous mixture of deuterium and hydrogen with a metal alloy material consisting essentially of TiNi, Ti_2Ni, or a mixture thereof, and thereafter separating a non-absorbed residual gas enriched in deuterium from the metal alloy material after a period of time sufficient for the absorption of hydrogen in the metal alloy material.

3,940,913

ROW CROP HARVESTING APPARATUS

Jerome A. Wallenfang, and Wilmer E. Witt, both of Appleton, Wis., assignors to Koehring Company, Milwaukee, Wis.

Filed May 17, 1973, Ser. No. 361,129
Int. Cl.[2] A01D *45/02*
U.S. Cl. 56—98 41 Claims



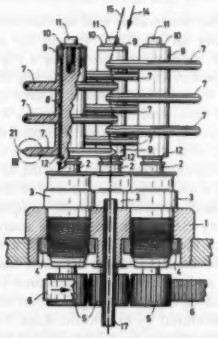
1. In a row crop harvesting apparatus having means including at least one forwardly and rearwardly extending endless conveyor belt for conveying the crop rearwardly and means for severing the crop from a field, the improvement comprising an adjustable forward idler in operable contact with said conveyor belt, said means for severing the crop including a rotary cutter operating coaxially with said adjustable forward idler, means for adjusting said forward idler forwardly and rearwardly while maintaining the relative orientation of said forward idler and said severing means, and means for rotating said rotary cutter.

3,940,914

FALSE TWISTER

Friedrich Schuster, Hammelburg, Germany, assignor to Kugelfischer Georg Schafer & Co., Schweinfurt, Germany

Filed Jan. 3, 1975, Ser. No. 538,410
Claims priority, application Germany, Jan. 4, 1974, 2400240
Int. Cl.[2] D02G *1/08*
U.S. Cl. 57—77.4 9 Claims



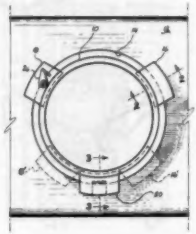
1. In an apparatus for false-twisting threads by means of friction discs which comprises three rotatably mounted mutually parallel spindles, each provided with at least one friction disc, the disc or discs on each spindle overlapping the discs on the other two spindles, and means for passing the thread to be false-twisted over the discs along a substantially helical path, the improvement which comprises providing one of the friction discs with a rotating twist stop edge disposed to interrupt the helical path of the thread in a kink-like manner on the exit face.

3,940,915

SPINNING RING MOUNTING MEANS

Walter A. Kluttz, c/o Kluttz Machine and Foundry Co., 711 E. Franklin St., Gastonia, N.C. 28052

Continuation-in-part of Ser. No. 509,441, Sept. 26, 1974, abandoned. This application Feb. 24, 1975, Ser. No. 552,538
Int. Cl.[2] D01H *7/64*
U.S. Cl. 57—122 13 Claims



1. Means for ring rail mounting of spinning rings comprising a set of three chuck elements, said elements each being arcuately grooved at one face for supported disposition in slidable relation within a ring rail spindle opening and also being arcuately grooved at the opposite face thereof for gripping in slidable relation a spinning ring to be installed at said ring rail spindle opening, and said elements having an aggregate arcuate length when slid to adjacency within said ring rail spindle opening that does not exceed 180°.

3,940,916

KNITTED OR WOVEN ION EXCHANGE FABRIC CONTAINING LOW DENIER FILAMENTS

Walther Gustav Grot, Chadds Ford, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed June 27, 1974, Ser. No. 483,570
Int. Cl.[2] D02G *3/02, 3/04*
U.S. Cl. 57—140 R 11 Claims

1. A fabric comprising filaments of a fluorinated polymer containing sulfonyl groups in $-SO_2X$ form with X selected from the group consisting of fluorine and chlorine, the filaments having a denier of no more than 400 and being individually supported by a material which serves to strengthen said filaments.

3. The fabric of claim 1 wherein said material is in the form of filaments individually twisted about the fluorinated polymer filaments.

3,940,917

COMPOSITE ELASTIC YARNS AND PROCESS FOR PRODUCING THEM

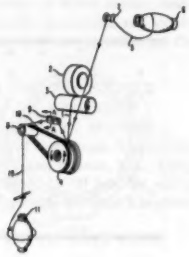
Donald Rittler Strachan, Martinsville, Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sept. 5, 1974, Ser. No. 503,500
Int. Cl.[2] D02G *3/32;* D02J *1/08*
U.S. Cl. 57—152 16 Claims

1. A composite yarn comprising uncrimped elastic yarn and at least five synthetic filaments of relatively inelastic material to protect the elastic yarn and provide desirable textile properties, the relaxed composite yarn being bulky and capable of being extended at least 100 percent in length when stretched until the relatively inelastic filaments first become load-bearing; said stretched composite yarn being characterized by load-bearing relatively inelastic filaments entangled tightly around the elastic yarn in intermittent zones of random braided structure and otherwise extending substantially parallel to the elastic yarn, there being an average entanglement spacing of less than 10 centimeters and said filaments being

essentially free from crunodal or other surface loops when the composite yarn is in said strecthed condition.

12. A process for combining elastic yarn, having a break elongation of greater than 100 percent, with relatively inelastic synthetic polymer filaments to produce a composite yarn, which comprises continuously feeding the elastic yarn with the relatively inelastic filaments through jetted high velocity fluid



and impinging the jetted fluid on the yarn axis at an angle of $90° \pm 45°$ to separate the filaments and entangle the filaments tightly around the elastic yarn in intermittent zones of random braided structure, the elastic yarn being fed under tension sufficient to extend the yarn to at least 100 percent greater length than its relaxed length, and the relatively inelastic filaments being fed at a rate which provides between 2 percent net underfeed and 2 percent net overfeed to the jetted fluid.

3,940,918

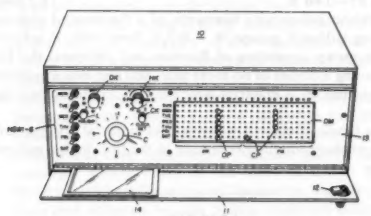
PROGRAMMER CLOCKS FOR BANKS AND LIKE INSTITUTIONS

Evan Philip Everson, Cedar Rapids, Iowa, assignor to Walter Kidde & Company, Inc., Clifton, N.J.

Filed Oct. 3, 1974, Ser. No. 511,788

Int. Cl.² G04C *21/00, 13/06*

U.S. Cl. 58—33 **3 Claims**



1. A programmer clock for the alarm systems of banking and like institutions comprising: an electrically powered clock having a face providing visual indication of the time of day; hour and day stepper switches, the hour stepper switch having successive positions indicative of the 24 hours of each day and electrically associated with the clock effective so that it is activated by the clock and serially advanced upon each hour of the day signalled by the clock, the day stepper switch having successive positions indicative of the seven days of each week and electrically associated with the hour stepper switch effective so that the day stepper switch is activated by the hour stepper switch and serially advanced after the end of each day signalled by the hour stepper switch, each of said switches having means for optionally and independently manually advancing or retarding the same; a diode matrix having first, second and third decks, the first deck having successive locations respectively electrically connected in series with said positions of the day stepper switch, the second and third decks each having successive locations respectively electrically each connected in series with said positions of the hour stepper switch, the matrix having means for electrically interconnecting selected locations of the first deck to selected locations of each of the second and third decks to provide an output effective to control an alarm system; holiday switches respectively interposed between said positions of the day stepper switch and said locations of the first deck effective to permit selected ones of said switch positions to be electrically disconnected from their respective ones of said deck locations; and signal means activated when any of the holiday switches provide said disconnection; the clock face, the manual means for the day and hour stepper switches, said deck locations of the matrix, the interconnecting means, the holiday switches and the signal means being all desposed upon a panel for visual observation thereof.

3,940,919

ELECTRONIC WRISTWATCH WITH ELECTRONIC SOUND EMITTER DEVICE

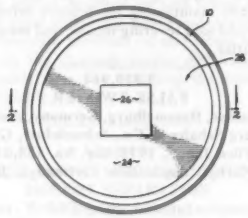
Tetuya Yasuda, Tokyo; Makoto Yoshida, Tokorozawa; Yoshifumi Mochizuki, Kodaira, and Shigeru Morokawa, Higashiyamato, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Oct. 2, 1974, Ser. No. 511,309

Claims priority, application Japan, Oct. 3, 1973, 48-115548[U]; Nov. 26, 1973, 48-132381; May 23, 1974, 49-59209[U]

Int. Cl.² G04C *21/16, 21/00*

U.S. Cl. 58—38 R **8 Claims**



1. An electronic wristwatch with an elctronic sound emitter device comprising an oscillator means for providing a frequency standard, said means providing a repetitive signal, a multi-stage frequency divider for reducing the frequency of the signal from the oscillator means, a time count means for determining the time, said means driven by a signal from the multi-stage frequency divider, a time display means to display the time content of said time count means, a control means to be controlled externally for controlling the setting of a sound emitting time in a memory means, a switch mechanism which is coupled to said control means to operate said control means, a memory means for storing the sound emitting time when said switch mechanism is activated, a detecting means for detecting the time matching between the setting of said memory means and the content of said time count means and thereupon providing a signal, a logic circuit means for providing a signal determined by said multi-stage frequency divider and said detecting means, said logic circuit means coupled to said detecting means and said multi-stage frequency divider, a sound emitter driving circuit coupled to said logic circuit means, a booster coil, a piezo-electric sound converter element, said piezo-electric sound converter element and said booster coils are connected in parallel, one end of said booster coil is coupled to the output end of said sound emitter driving circuit, the other end of said booster coil is coupled to a power terminal, whereby upon the correspondence of said time content with said memory content, said detecting means provides a signal to operate said logic circuit means to provide a signal from said multi-stage frequency divider to the input of

said sound emitter driving circuit thereby oscillating said piezo-electric sound converter element.

3,940,920

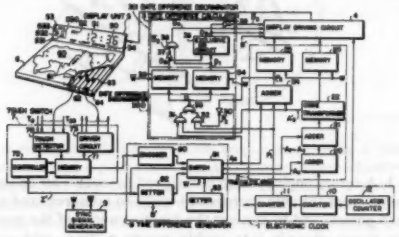
ZONE TIME DISPLAY CLOCK

Shoichi Nakamura, Tondabayashi; Toshiaki Inui, Nara, and Yoshio Horiike, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Continuation of Ser. No. 342,621, March 19, 1973. This application Nov. 14, 1974, Ser. No. 523,848

Int. Cl.² G04B *19/22*

U.S. Cl. 58—42.5 9 Claims



1. A world clock comprising:

a zone appointing and displaying means including an integrated structure of a map divided into a plurality of substantially equal time zones, a plurality of touch detection terminals disposed at locations on said map corresponding to cities or countries, and time zone display devices arranged beneath the map for providing a separate indication of each time zone on the map;

touch switch circuit means, including a touch detection circuit connected to said touch detection terminals for amplifying a designated location signal from a designated touch detection terminal to generate a touch signal at an output terminal corresponding to the location of the touch detection terminal on the map as well as the output terminals corresponding to all of the touch detection terminals, a location memory circuit connected to the output terminal corresponding to said location for storing the designated location, a display driver circuit connected between an output of said location memory circuit and said time zone display devices for activating the time zone display device corresponding to the designated location, and a control circuit connected to the output terminals corresponding to all of the touch detection terminals of the touch detection circuit and the location memory circuit for controlling the operation of the memory circuit;

an electronic clock circuit for generating a reference time signal, corresponding to a reference location, in the form of binary code;

a time difference generation circuit including an encoder circuit connected to the output of said location memory circuit for generating a time difference signal representing the time difference between the designated location and the reference location, a home location setting circuit for generating a signal representing the time difference between a home location and the reference location, and a switching circuit coupled to outputs of said encoder and home location settling circuits;

a time difference calculation circuit, including an adder circuit coupled to the reference electronic clock circuit and the switching circuit of said time difference generation circuit with the time of the store operation in the date difference calculation circuit.

3,940,921

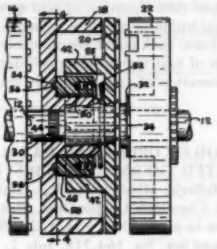
FRICTION DETENT TO PERMIT SETTING OF DIGITAL CLOCK

Emil John Niznik, Lake Geneva, Wis., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Apr. 9, 1975, Ser. No. 566,565

Int. Cl.² G04B *27/08*, *19/02*

U.S. Cl. 58—85.5 11 Claims



1. In a setting mechanism for a digital clock having a plurality of time indicating drums supported for rotation in axially spaced relation to one another, the combination comprising

rotating means adjacent to one of said drums and rotationally advanced at periodic time intervals, said one of said drums constituting a driven member,

yieldable indexing means through which said rotational advancement of said rotating means can similarly advance said driven member, said indexing means comprising

a detent member rotating with said rotating means and spring-biased toward said driven member, one of said member having

projections thereon, and the other thereof having

recesses equiangularly spaced therein, said projections being engageable in said drum, for driving engagement of said driven member by said detent member, and

setting means adapted to rotate said driven member independently of said indexing means by the application through said setting means to said driven member of sufficient torque to cause said projections to be forced out of said recesses.

3,940,922

NONCIRCULAR WATCH CASE

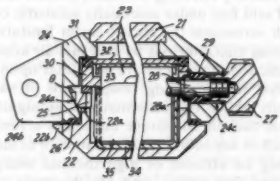
Tsutomu Miyasaka, and Akio Ishiyama, both of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Dec. 18, 1974, Ser. No. 534,109

Claims priority, application Japan, Dec. 18, 1973, 48-142254

Int. Cl.² G04B *37/08*

U.S. Cl. 58—90 R 7 Claims



1. A watertight watch casing comprising a back cover, a gasket of a preselected hardness mounted on said back cover, a case body overfitting said back cover and releasably connected thereto, said case body including a mounted crystal and a lug which may be pressured for releasing the connection between said case body and said back cover, said case body

overlying said gasket, an upstanding support mounted on said back cover extending interiorly into said casing, and a flat configured spring mounted on said upstanding support, said spring having at least one raised portion, said case body having at least one interiorly ascending incline and at least one concomitant lateral overhang defining a groove on its interior side wall corresponding to said at least one raised portion of said flat spring, said incline having an angle of ascension having a predetermined relationship to said hardness of said gasket, said at least one raised portion of said spring being normally accommodated within said groove in said case body when said case body and said back cover are connected, said at least one raised portion of said spring being self-depressing during release and connection of said case body and back cover.

3,940,923

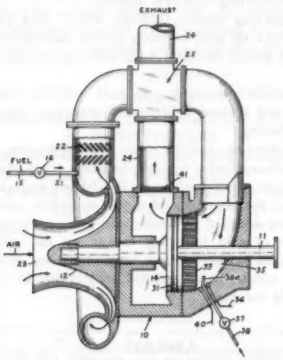
METHOD OF OPERATING CATALYTICALLY SUPPORTED THERMAL COMBUSTION SYSTEM

William C. Pfefferle, Middletown, N.J., assignor to Engelhard Minerals & Chemicals Corporation, Murray Hill, N.J.

Continuation-in-part of Ser. Nos. 142,939, May 13, 1971, abandoned, and Ser. No. 164,718, July 2, 1971, abandoned, and Ser. No. 197,323, Nov. 10, 1971, abandoned, and Ser. No. 358,411, May 8, 1973. This application Apr. 24, 1974, Ser. No. 463,436

Int. Cl.[2] F02C *3/16, 7/26*

U.S. Cl. 60—39.06 **16 Claims**



1. A method for operating a gas turbine by catalytically supported thermal combustion of carbonaceous fuel comprising (a) forming an intimate admixture of fuel and air, (b) contacting in a combustion zone at least a portion of said fuel-air admixture with solid oxidation catalyst occupying a major portion of the flow cross section of said combustion zone, (c) thereby effecting sustained combustion of at least a portion of said fuel under essentially adiabatic conditions at a rate which surmounts the mass transfer limitation, said combustion being characterized by said fuel-air admixture having an adiabatic flame temperature such that upon contact with said catalyst the operating temperature of said catalyst is substantially above the instantaneous autoignition temperature of said fuel-air admixture but below a temperature that would result in any substantial formation of oxides of nitrogen, (d) forming an effluent of high thermal energy containing uncombusted fuel values, and (e) thermally combusting at least partially the uncombusted fuel values contained in said effluent in an expansion zone of the turbine positioned in the path of said effluent to counteract the cooling effect occurring on expansion of gases within said gas turbine, whereby said thermal energy of said effluent and the energy from thermally combusting said uncombusted fuel values are utilized in operation of the turbine.

3,940,924

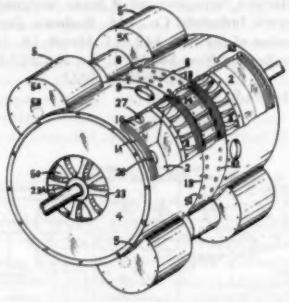
ROTARY ENGINE

Thomas Sanfran Miyada, P.O. Box 430, Summit, N.J. 07901

Filed Oct. 2, 1974, Ser. No. 511,235

Int. Cl.[2] F02C *7/06, 3/00*

U.S. Cl. 60—39.08 **10 Claims**



1. A rotary engine which is designed to receive air and other gasses from suitable sources of supply, to compress and ignite such gasses, and to convert the kinetic energy of the expanding gasses directly into usable rotary motion, said engine comprising, in unique and useful combinations:

a. a casing that is constructed in a substantially cylindrical form, and made to be divisible into two substantially equal cylindrical parts;

b. at least one pair of rotors, each rotor having a central section that resembles a cylindrical wheel, a peripheral section comprising a pair of axially spaced annular walls extending radially from the periphery of said central section and cooperating therewith to define an annular chamber, two substantially radially extending partitions dividing said annular chamber into two subchambers, said one subchamber serving as an oil reservoir and rotary piston, said other subchamber serving as a compression chamber, and an arrangement of turbine blades located on one of said annular walls on the side opposite said annular chamber; the said rotors keyed to

c. a central power output shaft that is mounted in the roller bearings of the hub of

d. a stationary cylindrical power chamber, which, by its position, separates the said casing into two cylindrical parts, and the said paired rotors into two opposite, but parallel, rotating members;

e. at least one paired-dams unit that functions as a dam to hold back liquids and gases or retain such fluids in said compression chamber for, and during, the compression of such fluids, each unit enclosed in a twin housing that is mounted on, and attached to, the peripheral cylindrical surface of the engine's casing;

f. a plurality of passageways for compressed gases originating in the said rotors and communicating with channels that lead into the combustors;

g. a plurality of combustors housed in the said cylindrical power chamber, and having their bifurcated exhaust nozzles aimed at turbine blades mounted on a radial wall of each rotor;

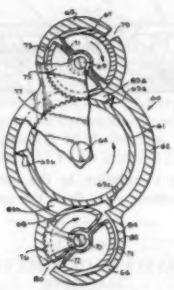
h. a lubrication means, consisting of a handleless roller rotatably held in the wall of each rotor's oil reservoir and not activated manually, that uses the working principle resembling, but not identical, to those of the ball-point pen, paint roller, and kitchen rolling pin to spread oil and grease by a rolling action caused by one of the contacting surfaces; and

i. a plurality of slightly curved spoke-like members of each rotor's wheel-like section that draw in ambient air in the manner of fan blades, and that cool the engine internally.

3,940,925
ROTARY INTERNAL COMBUSTION ENGINE

Arthur P. Kelley, 1836 Augusta Drive, Houston, Tex. 77027

Filed Jan. 28, 1974, Ser. No. 437,281
Int. Cl.² F02C 3/02; F02G 3/00; F03C 3/00
U.S. Cl. 60—39.45 5 Claims



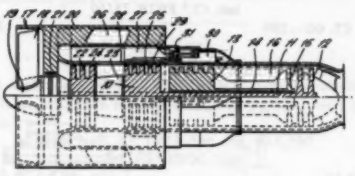
1. A rotary internal combustion engine comprising a compressor section, a power section, and a combustion chamber therebetween; said compressor section comprising a pair of intermeshing gear members mounted in a compressor housing, inlet means on one side of said compressor housing and discharge means on the opposite side of said compressor housing, said intermeshing compressor gear members being mounted for rotation in opposite directions to compress and transfer air-fuel mixtures from said inlet means to said discharge means; said discharge means being connected to said combustion chamber for combustion of said compressed air-fuel mixtures; said power section comprising at least one power rotor mounted in a housing having inlet means connected to said combustion chamber through which exploding gases are directed against the periphery of said power rotor for driving an output shaft connected to said power rotor, said power rotor being connected to at least one of said compressor gear members for rotation of said compressor gear members; said power section comprising at least one valve rotor connected to said power rotor for cooperative rotation relative thereto, said power rotor being provided with a plurality of radial vanes projecting from the periphery thereof, said valve rotor being provided with valve ports which, upon rotation of said valve rotor, alternately permit and block flow of said exploding gases between said combustion chamber and the periphery of said power rotor, permitting said exploding gases to alternately expand against said power rotor vanes to rotate said power rotor, said power section being provided with exhaust means through which said expanded exploding gases may be selectively exhausted; said valve rotor comprising a radial passage therethrough, each end of which terminates at the periphery of said valve rotor, providing communication between said power section inlet and said power rotor periphery at preselected time intervals related to the rotation of said power rotor and said valve rotor.

3,940,926
JET PROPULSION ENGINES

Alfred C. Craig, 12 Arley Road, Parkstone, Poole, Dorset, England

Filed Aug. 31, 1973, Ser. No. 393,440
Int. Cl.² F02K 3/04
U.S. Cl. 60—226 R 2 Claims

1. A jet propulsion engine comprising an air intake casing, a fan rotatable in the air intake casing, a main casing, an air compressor in the main casing, compressor means in the main casing rearwardly of the air compressor, a first disconnectable drive coupling between the fan and the air compressor, for the selective controllable driving of the air compressor by the fan, a second disconnectable drive coupling between the air compressor and the compressor means, for the selective controllable driving of the compressor means by the air compressor, a by-pass duct means having a rearwardly directed outlet and an aperture communicating with the compressor means, and valve means for varying the degree of opening of the outlet

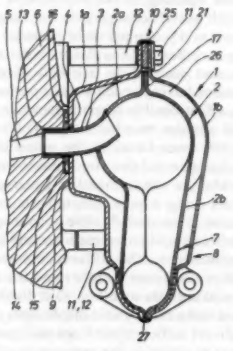


and the aperture whereby the proportion of the intake air flow passing from the fan to the compressor means and the proportion of the intake air flow passing from the fan through the by-pass duct means and out of the outlet is controllably varied inversely relative to each other.

3,940,927
INTERNAL COMBUSTION ENGINE HAVING A REACTOR FOR AFTERBURNING OF UNBURNED EXHAUST GAS CONSTITUENTS

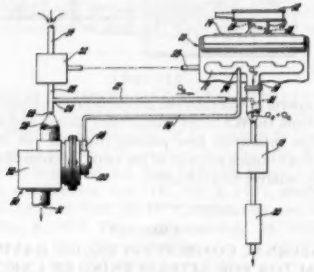
Gerhard Maurhoff, Neckarsulm, and Johannes Steinwart, Bad Friedrichshall, both of Germany, assignors to Audi NSU Auto Union Aktiengesellschaft, Neckarsulm, Wurttemberg, Germany

Filed Aug. 7, 1974, Ser. No. 495,396
Claims priority, application Germany, Aug. 9, 1973, 2340342
Int. Cl.² F01N 3/10, 7/10
U.S. Cl. 60—282 9 Claims



1. An internal combustion engine having an engine housing and having a reactor for afterburning of unburned constituents in the exhaust gas, the reactor having a shell with a periphery and containing a heat-insulated, reactor chamber connected thereto and being freely movable beyond the point of connection to the shell with at least one inlet nozzle extending freely through the shell and communicating with an outlet passage of the engine, and an outlet for escape of the exhaust gases from the reactor chamber, the inlet nozzle protruding freely into the outlet passage, and the shell having a portion around the inlet nozzle and in contact with the engine housing and being bolted at its periphery to the engine housing, and the inlet nozzle protruding into the outlet passage of the engine with clearance all around and being surrounded by a packing.

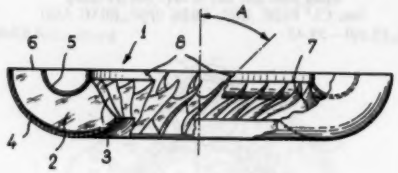
3,940,928
AIR DIVERTER VALVE
Donald J. Pozniak, Sterling Heights, and Robert M. Siewert, Birmingham, both of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Feb. 11, 1974, Ser. No. 441,396
Int. Cl.² F02B *75/10*
U.S. Cl. 60—289 **2 Claims**



2. An air diverter valve for use with an internal combustion engine having an emission control system including an exhaust system for exhaust gas flow from said engine, an air pump, and a passage connecting said pump to said exhaust system for secondary air flow thereto, said air diverter valve comprising a housing forming a pump discharge pressure chamber having an inlet port adapted for connection to said passage and a discharge port opening to the atmosphere, a valve member associated with said discharge port for varying the discharge flow area from said pump pressure chamber, a rod connected to said valve member, an annular member adapted for registration with and secured to one end of said housing, said annular member having at least one aperture opening to the atmosphere, a first flexible diaphragm secured at its periphery between said annular member and said housing and responsive to the difference between the pump discharge pressure within said chamber and the atmospheric pressure within said annular member, a cover member secured to said annular member and having a port adapted for connection to said exhaust system, a second flexible diaphragm secured at its periphery between said cover member and said annular member and responsive to the difference between the exhaust pressure within said cover member and the atmospheric pressure within said annular member, said diaphragms being connected to said rod whereby said disphragms position said valve member to divert sufficient air from said passage through said discharge port to maintain the pressure in said passage in fixed proportion to the pressure in said exhaust system and thereby proportion the amount of air flow from said pump through said passage to the exhaust system to the exhaust flow through said exhaust system.

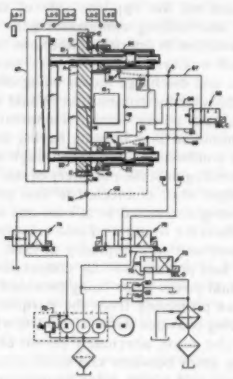
3,940,929
HYDRODYNAMIC TRANSMISSION SYSTEM
Alexandre Bezimensky, 9, Rue Lekain, Paris, France
Filed Dec. 3, 1974, Ser. No. 529,211
Int. Cl.² F16D *33/00*
U.S. Cl. 60—330 **17 Claims**

1. A hydrodynamic transmission system comprising at least one pump and a bladed turbine arranged to form a toroidal fluid circuit, wherein the leading edges of the blades of the pump and turbine are inclined relative to the corresponding radial plane, and wherein these blades are designed in such a way as to extend the path followed by the streams of fluid



nearest the centre in relation to the path followed by the streams of fluid furthest away from the centre.

3,940,930
HYDRAULIC SYSTEM FOR INJECTION MOLDING MACHINE
Russell B. Rosander, Springfield, Mass., assignor to Package Machinery Company, East Longmeadow, Mass.
Filed Jan. 20, 1975, Ser. No. 542,100
Int. Cl.² F15B *13/07*; F16D *31/00*
U.S. Cl. 60—375 **16 Claims**



1. In an injection molding machine of the type having a fixed frame supporting a stationary mold part and a movable platen which supports a mating mold part, and a hydraulic system for the movable platen, said system comprising:

a. parallel rods slidably received in the fixed frame and connected to the movable platen for closing movement toward and opening movement away from the stationary mold part,

b. at least one of said rods having a portion which projects rearwardly through the fixed frame generally opposite the movable platen and a first piston on said projecting portion,

c. means defining a first cylinder for slidably receiving said first piston, and a first fluid conduit for providing a first fluid to a front face of said first piston to close said mold parts,

d. a second piston defined on said first cylinder defining means, said first cylinder defining means being slidably received on said rods, said second piston having a forward limit position wherein a forwardly facing stop surface abuts the fixed frame,

e. second cylinder defining means fixed in the machine frame and slidably receiving said second piston, and a

second fluid conduit for providing a second fluid to the front face of said second piston to bias said first cylinder rearwardly, and

f. valve means for selectively closing said first fluid conduit when second fluid is provided at said second fluid conduit.

3,940,931

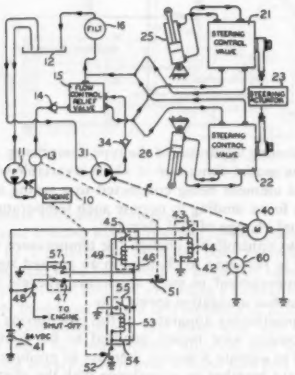
AUTOMATIC CONTROL CIRCUIT FOR AN ELECTRICALLY POWERED HYDRAULIC PUMP

Kenneth W. Renfro, Macon, and Richard E. Guhl, Decatur, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 17, 1975, Ser. No. 541,752

Int. Cl.² F15B *20/00, 11/16*

U.S. Cl. 60—403 **10 Claims**



1. In a vehicle having an engine, hydraulic control means actuated by hydraulic fluid under pressure, a main hydraulic pump driven by said engine to provide hydraulic fluid under pressure for actuating said control means, and an auxiliary hydraulic pump driven by an electric motor to provide hydraulic fluid under pressure for actuating said control means; an electrical control circuit for said electric motor comprising:

a. a source of electrical power;

b. a first solenoid operated relay having normally open contacts connected in series with said electric motor across said source of electrical power;

c. a second solenoid operated relay having normally open contacts connected in series with the solenoid of said first solenoid operated relay across said source of electrical power;

d. a third solenoid operated relay having normally open contacts;

e. first switch means having normally closed contacts adapted to be automatically opened by a given fluid flow from said main hydraulic pump;

f. second switch means having normally open contacts adapted to be automatically closed after said engine is in normal operation; and

g. third switch means having normally closed contacts adapted to be manually opened; said normally closed contacts of said first switch means and the solenoid of said second solenoid operated relay being electrically connected in series with each other and with said normally open contacts of said second switch means across said source of electrical power, the solenoid of said third solenoid operated relay being electrically connected across said series connected normally closed contacts of said first switch means and solenoid of said second solenoid operated relay, said normally open contacts of said third solenoid operated relay being electrically connected in parallel with said normally open contacts of said second switch means, and said contacts of said third switch means being interposed between at least said solenoid of said third solenoid operated relay and said source of electrical power.

3,940,932

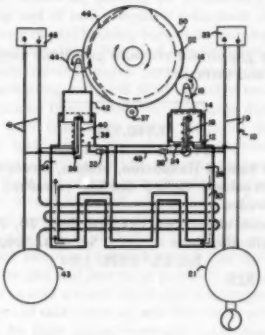
NONCOMBUSTION ENGINE

Robert Ambrose, Lynnfield, and Lewis H. Noll, Topsfield, both of Mass., assignors to Lance Engineering Co., Inc., Salem, Mass.

Filed Nov. 13, 1973, Ser. No. 414,701

Int. Cl.² F02G *1/04*

U.S. Cl. 60—517 **21 Claims**



1. A noncombustion engine comprising an annular body rotatably mounted; an expansion chamber mounted proximate said body; a power piston reciprocably mounted in said chamber, the outer end of said piston being in contact with a portion of said annular body spaced from the turning axis thereof; a contraction chamber spaced from said expansion chamber; a recovery piston reciprocably mounted in said contraction chamber, spaced from said expansion chamber; a conduit connecting said chambers; said expansion chamber having fluid at a first temperature and pressure therein; means for heating said fluid to an elevated second temperature and pressure which forces said power piston against said annular body rotating the same; means for driving said power piston back into said expansion chamber to expel and charge said fluid into said conduit, and thence into said contraction chamber, to drive said recovery piston outwardly of said chamber; means for further cooling said fluid in said contraction chamber and means for driving said recovery piston back into said contraction chamber to drive the cooled and contracted fluid back into said expansion chamber to recommence the power cycle and drive said annular body.

3,940,933

METHOD FOR REGULATING THE OUTPUT OF A STIRLING-TYPE HOT GAS ENGINE AND DEVICE FOR THE SAME

Per Henrik Gösta Nyström, Borensberg, Sweden, assignor to Forenade Fabriksverken, Sweden

Filed Oct. 17, 1974, Ser. No. 515,718

Claims priority, application Sweden, Oct. 19, 1973, 7314258

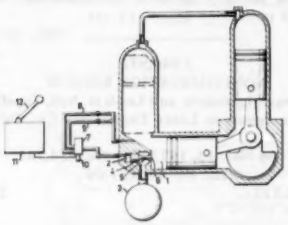
Int. Cl.² F02G *1/04, 1/06*

U.S. Cl. 60—522 **10 Claims**

1. A method for controlling the power of a hot gas engine of the Stirling type having a dead space separated from the engine internal gas circuit, comprising:

periodically connecting the dead space to the gas circuit and disconnecting the dead space from the gas circuit for

a combined period of time comprising one control cycle of constant duration independent of engine speed,



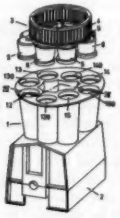
whereby gas circuit pressure amplitude respectively decreases and increases.

3,940,934

STIRLING ENGINES

Sven Anders Samuel Hakansson, Malmo, Sweden, assignor to Kommanditbolaget United Stirling (Sweden) AB & Co., Malmo, Sweden

Continuation of Ser. No. 181,870, Sept. 20, 1971. This application June 4, 1973, Ser. No. 366,422
Int. Cl.[2] F02G 1/04
U.S. Cl. 60—525 2 Claims



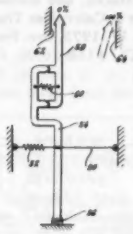
1. A Stirling engine arrangement comprising in combination, a single-crank shaft, a plurality of at least four cylinders disposed along paths forming a V-arrangement extending from said crank-shaft, each cylinder containing a piston dividing the cylinder into a high temperature region and a low temperature region the low temperature region being located adjacent the crotch of said V-arrangement, a separate regenerator-cooler unit connected to each cylinder and disposed in said V-arrangement in a location positioned between said two adjacent ones of said cylinders to place each cylinder and its regenerator-cooler adjacent each other near the crotch of said V-arrangement with the low temperature part of one cylinder being connected by a working gas flow channel to the cooler portion of the regenerator-cooler unit and with the high temperature part of another cylinder located adjacent thereto connected by heater tubes to the regenerator portion of the regenerator-cooler unit, said working gas flow channel connecting each said cylinder to its adjacent heat exchanger unit through a short passageway near the crotch of said V-arrangement, said heater tubes disposed in an array about said cylinders at the high temperature region away from the crotch of said V-arrangement to define inside the V-arrangement between the cylinders a heating space, and a single burner unit being mounted in said heating space for heating the heater tubes for each of said cylinders.

3,940,935

POSITIONING DEVICE USING NEGATIVE SPRING-RATE TENSIONING MEANS

David A. Richardson, Sheldonville, and Robert J. Robinson, Lexington, both of Mass., assignors to The Foxboro Company, Foxboro, Mass.

Continuation of Ser. No. 239,906, March 31, 1972, abandoned. This application Feb. 22, 1974, Ser. No. 444,824
Int. Cl.[2] F03G 7/06
U.S. Cl. 60—528 17 Claims



1. Positioning apparatus of the type comprising: an element at least one spatial dimension of which is variable with temperature, said element being connected to a spring arranged to develop a force tending to oppose such temperature-induced dimensional change of said element;

means to controllably change the temperature of said element in response to changes in an applied signal;

that improvement in such apparatus wherein said spring means has a negative spring rate.

14. In positioning apparatus of the type having a temperature-responsive wire means adapted to be contracted and expanded to actuate a motion member to produce movement of an output member in accordance with the contraction/expansion of the wire means; said apparatus comprising:

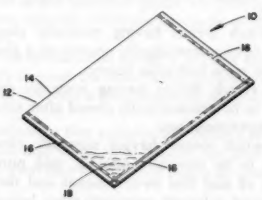
spring means coupled between said motion member and said output member normally providing corresponding movement of said two members but permitting relative movement therebetween in the event movement of said output member is prevented, thereby limiting the stress in said wire means.

3,940,936

PLANT COVER AND ACTUATOR

Donald A. Kesinger, Denver, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Division of Ser. No. 129,772, March 31, 1971, Pat. No. 3,698,131. This application May 30, 1972, Ser. No. 257,898
Int. Cl.[2] F03G 7/06
U.S. Cl. 60—531 5 Claims



1. A thermally responsive actuator adapted for actuating an air circulation vent of a plant cover comprising:

a hermetically sealed uncorrugated polymeric and generally flat bag of a pliable and substantially gas impermeable film material, the bag collapsible and expansible in substantially all directions; and

a liquid capable of being vaporized and condensed within ambient temperature ranges, said liquid disposed within said bag in sufficient amount to inflate the bag when said liquid is vaporized.

3,940,937

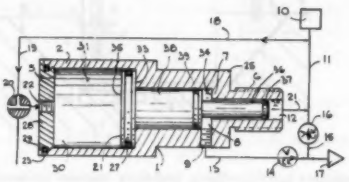
INTENSIFIER

Richard S. Paulukonis, 6660 Greenbriar Drive, Cleveland, Ohio 44130

Continuation-in-part of Ser. No. 244,019, April 14, 1972, Pat. No. 3,815,481. This application Jan. 18, 1974, Ser. No. 434,568

Int. Cl. F15b 7/00

U.S. Cl. 60—533 **6 Claims**



1. A pressure intensifier comprising:

an elongated housing having first and second ends interconneced by a differential diameter bore extending therethrough, said bore having a first large size open receiver end adjacent said first end extending a substantial portion inwardly therefrom toward said second end along the axis of said bore including a first inner end wall therein, a second small size bore portion adjacent said second end extending inwardly therefrom toward said first end along the axis of said bore, a coaxial third intermediate size bore portion interconnecting the innermost ends of said first and second bores extending inwardly from said first end wall toward said second bore including a second inner wall adjacent said second bore,

an end cap permanently secured in said open receiver end including a fluid port therein,

said first open receiver end having a diameter larger than the diameter of said second and third bores serving as an actuating end of said intensifier, said third intermediate size bore having a diameter larger than said second small size bore but smaller then the diameter of said first open receiver end serving as a pressure intensification chamber, said second small bore having a diameter smaller than the remaining bore portions serving as a feeding end of intensifier with said small opening permitting fluid supply thereto, said housing further including a side port entering housing wall adjacent said second inner wall perpendicularly for fluid exhaust from said third size bore portion during the pressure intensification therein,

a pressure intensification means for elevating pressures of the fluid entering said third size bore portion via said fluid supply opening and exiting at higher pressures via said fluid exhaust side port, said pressure intensification means movable from a first position wherein said small fluid supply opening is closed to a second position wherein said fluid supply opening is wide open, means for generating an airless evacuated annulus therein with substantial vauum force in at least one of said positions, means for shifting said pressure intensification means to move from one of said positions by the pressurized fluid force coupled with said vacuum force means efficiently and with energy conservation to another of said positions, means for maintaining said pressure intensification means in one of said positions including valving means for porting fluid to fluid operable means,

said pressure intensification means further including an elongated axially slidable piston having differential diameters of corresponding close sliding fit with said differential diameter housing bore portions, with a first large diameter short portion of said piston at one end serving as an actuating end of said intensifier, a second small diameter elongated portion of said piston at the opposite end serving as a plugging piston end for fluid supply opening and a third intermediate diameter elongated portion interconnecting the innermost ends of said first and second portions of said piston serving as a pressure booster when shuttled inside said housing bore from the first small piston engaged position with said fluid supply opening closed to the second small piston disengaged position allowing fluid supply to said pressure intensification chamber when said valving means initiate said fluid operable means for porting the pressurized fluid in said actuating end of said intensifier selectively allowing fluid flow to one of said housing bore ends thereby shifting said piston between said first and second positions wherein when said valving means permit pressurization of said piston actuating end, said fluid operable means will shift said piston by fluid action over said large diameter piston end to said first small piston engaged position, and wherein said valving means permit depressurization of said piston actuating end by allowing escape of the pressurized fluid out of said actuating housing end, said fluid operable means will shift said piston by fluid action ove said small diameter piston end to said second small piston disengaged position while simultaneously generating said evacuated annulus formed between said third portion of said piston and said first large size bore portion when said piston is in said second small piston disengaged position, the return of said piston to said first small piston engaged position by fluid action over said large diameter piston end accompanied by the vacuum force in said evacuated annulus substantially aiding in the operation of said intensifier when fluid trapped inside said intensification chamber is subjected to the force said pressure booster exerts over said fluid, said force being proportional to the diametral differences of said first large actuating and said third intermediate diameters of said piston and capable of having pressure elevation inside said intensification chamber forcing fluid to exit via said side port therefrom at substantial pressure boost induced thereto by the same pressurized fluid action over said piston surfaces entailing mechanical advantage therein.

3,940,938

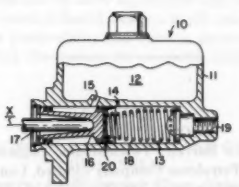
CUP SEAL FOR A MASTER BRAKE CYLINDER

Donald F. Durham, Peoria, and Robert D. McFeeters, Washington, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 9, 1974, Ser. No. 495,966

Int. Cl.² B60T 11/26

U.S. Cl. 60—588 **15 Claims**



1. In a master brake cylinder comprising a housing defining a bore therein, a piston reciprocally mounted in said bore for movement along a longitudinal axis thereof and an elastomeric cup seal disposed in said bore to be reciprocated along with said piston and having disc shaped base portion integrally

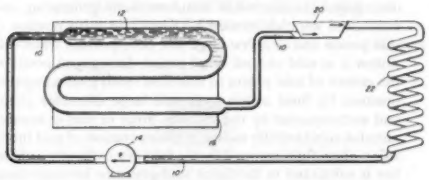
connected at its periphery to a flexible annular flange portion thereof disposed in sealing relationship within said bore, the improvement wherein said annular flange portion comprises means formed thereon for inducing rotation of said cup seal relative to said housing upon reciprocal movement of said piston, said means comprising a plurality of circumferentially disposed grooves formed on a periphery of said flange portion with each groove extending generally in the direction of said longitudinal axis from an open end thereof disposed at the junction of said base portion with said flange portion to a termination at a closed end thereof disposed between the axial ends of said cup seal.

3,940,939

VAPOR CYCLE ENGINE HAVING A TRIFLUOROETHANOL AND AMMONIA WORKING FLUID

Jerry P. Davis, Concord, Mass., assignor to Thermo Electron Corporation, Waltham, Mass.

Filed Apr. 14, 1975, Ser. No. 567,799
Int. Cl.² F01K *25/06*
U.S. Cl. 60—657 **14 Claims**



1. A closed vapor cycle engine having iron alloy parts comprising:
   a trifluoroethanol working fluid wherein said working fluid is in contact with said iron alloy parts of said engine;
   vapor generating means for vaporizing said working fluid;
   expander means for expanding working fluid vapor to produce work;
   condenser means for condensing expanded working fluid vapor to liquid; and
   pump means to introduce condensed working fluid vapor to said vapor generator;
   wherein said working fluid further comprises ammonia in sufficient quantity to inhibit corrosion of said iron alloy parts.

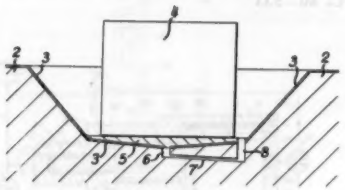
3,940,940

PROTECTION METHOD

Joseph Edward Barrett, Twickenham, England, assignor to The British Petroleum Company Limited, London, England

Continuation-in-part of Ser. No. 386,621, Aug. 8, 1973, abandoned. This application Nov. 1, 1974, Ser. No. 520,093
Claims priority, application United Kingdom, Aug. 12, 1972, 37714/72
Int. Cl.² B65G *5/00*; B65D *25/00*
U.S. Cl. 61—1 R **13 Claims**

1. A system for rendering the earth ground surfaces of a hydrocarbon storage tank bund impervious to hydrocarbon liquid and for detection of hydrocarbon seepage from said tank comprising
   a. a laminate of
      i. a polymeric membrane on the ground surface of said bund, and
      ii. a continuous, glass-fibre reinforced, sheet of a cured unsaturated polyester resin on said membrane,
      said membrane being capable of preventing loss of unsaturated polyester resin prior to its cure and sufficiently flexible to conform to the contours of the ground surface



under the weight of the uncured resin, said laminate extending to at least the perimeter of the walls of said bund;
   b. drain means in said laminate within the area to be occupied by said tank;
   c. at least one inspection chamber disposed outside the periphery of said tank and below the bottom of said tank; and
   d. conduit means for conveying by gravity hydrocarbon liquid collecting in said drain means from said laminate to said inspection chamber.

3,940,941

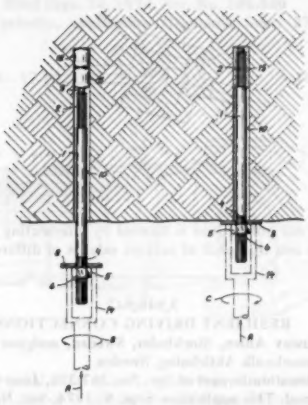
ANCHOR BOLTS FOR MINE ROOFS AND METHOD FOR INSTALLING SAME

Andre Libert, 8 rue des Pins, Crusnes, and Gilbert Francois, 8 rue du Colonnel Bauret, Audun-le-Tiche, both of France, assignors to Acieries Reunies de Burbach-Eich-Dudelange S.A. ARBED, Audun-le-Tiche, France

Filed Apr. 1, 1974, Ser. No. 457,132
Claims priority, application France, Apr. 2, 1973, 73.11720
Int. Cl.² E21D *21/00*
U.S. Cl. 61—45 B **4 Claims**

1. In an underground passage having a roof provided with at least one substantially vertical bore accommodating a reinforcement, the improvement wherein said reinforcement comprises:
   a metallic bolt having a threaded upper extremity inserted into said bore and a threaded lower extremity projecting from the bore;
   a hardenable mass of bonding agent surrounding said upper extremity of said bolt for anchoring same to the roof;
   a perforated retaining element surrounding said lower extremity outside said bore; and
   a nut engaging the threads of said lower extremity and bearing from below upon said element, thereby urging same under pressure against the roof surface and holding said bolt under tension, said lower extremity being provided with a discontinuity along the threads thereof

spaced from said nut and disposed therebelow to prevent a detachment of said nut from said bolt whereby said nut is displaceable into contact with said discontinuity by an



unscrewing motion enabling unidirectional rotation of said bolt by a nut-engaging tool to stir said bonding agent prior to hardening thereof.

3,940,942

SUBMARINE PIPELINES

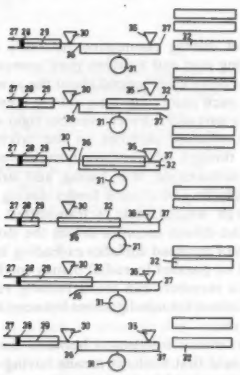
Gordon Shields Gower, French's Forest, Australia, assignor to Nabalco Engineering Pty. Limited, Sydney, Australia

Division of Ser. No. 363,969, May 28, 1973, Pat. No. 3,849,997. This application Aug. 19, 1974, Ser. No. 498,601

Claims priority, application Australia, May 29, 1972, 9126/72

Int. Cl.[2] F16L *1/00*; F01B *15/02*

U.S. Cl. 61—72.3 **3 Claims**



1. Propelling means for a pipeline as it is formed at a site to any desired length as a continuous pipeline and then directing the interconnected unitary pipeline to a site location for ultimate use adapted for passing fluids from end to end of the interconnected unitary pipeline, said propelling means comprising; a first sealing means mounted on the preformed pipeline and sealing one leading end thereof; a second sealing means slidably mounted in the preformed pipeline and spaced from said first sealing means; tube means connected to a source of pressurized fluid supply and mounted in the pipeline to deliver pressurized fluid into the pipeline between the first and second sealing means; and stop means on the tube means to prevent movement of the tube means and the second sealing means as said pipeline slides upon said second sealing means as a result of said pressurized fluid acting upon the first sealing means to move the leading end of the pipeline away from said second sealing means due to engagement of the pressurized fluid with the first sealing means to move the movable pipeline away from the stationary stop means and tube as long as additional pressurized fluid is being supplied and thereafter until the volume between the first and second sealing means increases sufficiently to dissipate the fluid pressure.

3,940,943

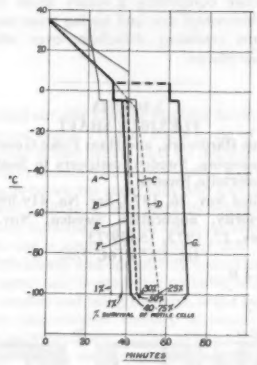
MULTISTAGE FREEZING SYSTEM FOR PRESERVATION OF BIOLOGICAL MATERIALS

John D. Sikes, and Charles P. Merilan, both of Columbia, Mo., assignors to The Curators of the University of Missouri, Columbia, Mo.

Filed Jan. 22, 1975, Ser. No. 543,029

Int. Cl.[2] F25D *17/02*

U.S. Cl. 62—64 **2 Claims**



1. A process for the cryo-preservation of living cells comprising the steps of:

collecting a sample of living cells at ambient temperature;

diluting the sample collected with a liquid cryo-protective agent;

slowly cooling the mixture of cells and agent to a temperature in the range of about +3°C to +8°C;

rapidly cooling the mixture to a temperature just below the freezing point of the mixture;

holding the mixture at just below freezing for a short period of time sufficient to allow adjustment and stabilization of the temperature induced changes in pH and alterations in membrane permeability and osmotic pressure; and

rapidly cooling the mixture to cryogenic storage temperature.

3,940,944

AUTOMATIC GLASS WASHER AND CHILLER DISPENSER

James M. Lapeyre, 13 Richmond Place, New Orleans, La. 70115

Filed Oct. 17, 1974, Ser. No. 515,445

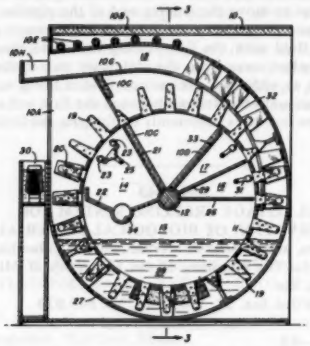
Int. Cl.[2] F25D *25/04*; B08B *3/02*, *9/08*

U.S. Cl. 62—322 **5 Claims**

1. An automatic glass washer and chiller dispenser comprising

a. wash means,

b. rinse means,
c. chilling means, and
d. ferris wheel type rotary transfer means for advancing dirty glasses through said wash means and rinse means to



said chilling means for subsequent dispensing while in a chilled state comprising a rotary drum means driven about a horizontal axis and having truncated perforated projections extending therefrom over which inverted glasses are placed.

3,940,945

FLEXIBLE SHAFT

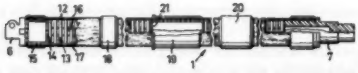
Ragnar Malcus Härdmark, and Hans Folke Georg Kornbrink, both of Linkoping, Sweden, assignors to Saab-Scania Aktiebolag, Sodertalje, Sweden

Filed Nov. 26, 1973, Ser. No. 419,099

Claims priority, application Sweden, Nov. 27, 1973, 15438/72; Nov. 27, 1973, 15439/73

Int. Cl.² F16C *1/02*

U.S. Cl. 64—2 R **15 Claims**



1. A flexible and torsion-stiff torque transmitting shaft comprising

a. means for transmitting torque from a first torque-transmitting member to a second torque-transmitting member spaced from the first torque-transmitting member along a longitudinal direction, said means comprising a flexible hose disposed generally along said longitudinal direction and operatively connected at its ends to the first and second members, and

b. means for supporting said flexible hose from the interior thereof to prevent play between the first and second torque-transmitting members, said means including a flexible core making contact with and supporting said hose at several places along the length thereof.

3,940,946

UNIVERSAL JOINT

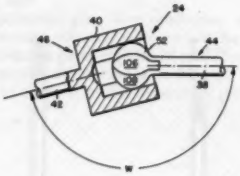
George L. Andersen, Columbus, Ohio, assignor to General Signal Corporation, Rochester, N.Y.

Filed Oct. 2, 1974, Ser. No. 511,326

Int. Cl.² F16D *3/02*

U.S. Cl. 64—8 **20 Claims**

1. A universal joint including a drive member and a driven member, one of said members including a curved polyhedron and the other of said members including a socket for receiving said curved polyhedron, the improvement comprising: said curved polyhedron having six sides and characterized in that



said curved polyhedron is formed by intersecting cylindrical surfaces and that each of said six sides is of different width.

3,940,947

RESILIENT DRIVING CONNECTIONS

Karl Gustav Ahlen, Stockholm, Sweden, assignor to S.R.M. Hydromekanik Aktiebolag, Sweden

Continuation-in-part of Ser. No. 367,376, June 6, 1974, abandoned. This application Sept. 9, 1974, Ser. No. 504,235

Claims priority, application United Kingdom, June 26, 1972, 29919/72

Int. Cl.² F16D *3/64*

U.S. Cl. 64—14 **27 Claims**

1. A resilient driving connection rotatably drivingly connecting a driving part and a driven part, comprising:

a plurality of drive units spaced about the axis of rotation of the parts, each unit comprising a drive member rigid with the driving part and a driven member rigid with the driven part, first opposed surfaces on the driving and driven members through which drive normally occurs, second opposed surfaces on the driving and driven members substantially free of driving forces during normal drive, but through which force is transmitted upon braking wherein the driven member drives the driving member, both pairs of opposed surfaces extending in planes which are radial or parallel to radial planes so that the driving and driven members can move radially relative to each other to correct for misalignment between the driving and driven parts,

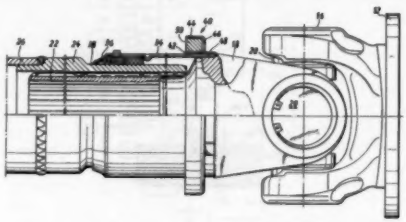
first resilient means interposed between the first opposed surfaces, said first resilient means having means for absorbing energy and becoming stiffer as the driving load increases, such that the resonant frequency thereof increases sufficiently rapidly with increased load that it stays above the actual frequency of vibration of the resilient means during normal operation thereof, and second resilient means interposed between the second opposed surfaces, said second resilient means having a stiffness less than that of the first resilient means so as to permit relative movement of both pairs of opposed surfaces for correcting for misalignment, but sufficiently stiff to maintain contact between the second opposed surfaces during substantially all normal driving conditions.

3,940,948

UNIVERSAL JOINT SHAFT

Josef Schultenkamper, Essen, Germany, assignor to Gelenkwellenbau GmbH, Germany

Filed Sept. 24, 1974, Ser. No. 508,840
Claims priority, application Germany, Sept. 27, 1973, 2348629
Int. Cl.² F16D 3/26
U.S. Cl. 64—17 R 10 Claims



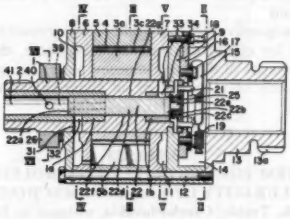
1. A universal shaft balancing device which comprises a sheet metal ring of C-shaped cross section having an inner peripheral arm adapted to be locked on the shaft, a deformable outer peripheral arm and a web connecting the arms, said C-shaped ring providing an annular groove with an open face at one axial end thereof adapted to receive balancing weights to be locked in the groove by inwardly deforming the outer peripheral arm of the ring.

3,940,949

HYDRAULIC, AUTOMATICALLY ADJUSTABLE TIMING DEVICE FOR FUEL INJECTION

Seibi Ohki, Higashi-Matsuyama, Japan, assignor to Diesel Kiki Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 30, 1974, Ser. No. 510,737
Claims priority, application Japan, Oct. 5, 1973, 48-111502
Int. Cl.² F16D 5/00
U.S. Cl. 64—25 2 Claims



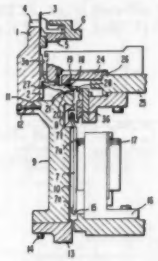
1. A hydraulic, automatically adjustable timing device for fuel injection in which a rotor having vanes and a casing having radial members are coaxially connected to a drive shaft and a driven shaft respectively, each vane and each radial member forming an operating chamber having a passage to permit fluid in and out; the bore of said drive shaft having disposed therein a pilot valve rotatable by centrifugal force of flyweights and having separate fluid chambers provided with fluid passages respectively, said pilot valve controlling the opening and closing of the fluid chambers, resulting in rotational transmission and relative movement between the drive shaft and the driven shaft through fluid present in the chambers; the pilot valve having a flat shaft which separates the two fluid chambers and forms lands to control communication of the flow passage with the fluid chambers, said lands being parallel to the axis of said pilot valve, said chambers being in communication with the atmospheric pressure side and the fluid pressure source side respectively.

3,940,950

LEVER NEEDLE SELECTING MEANS FOR CIRCULAR KNITTING MACHINES

Masatoshi Sawazaki, Kobe, Japan, assignor to Precision Fukuhara Works, Ltd., Kobe, Japan

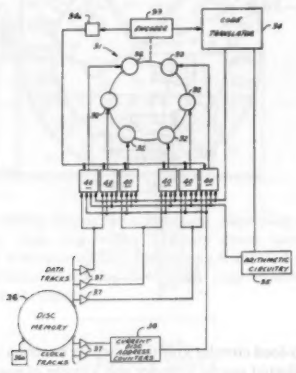
Filed July 5, 1974, Ser. No. 485,885
Claims priority, application Japan, Sept. 21, 1973, 48-106660
Int. Cl.² D04B 9/00
U.S. Cl. 66—50 R 4 Claims



1. A multi-feed circular knitting machine having a vertically extending slotted needle cylinder and a circle of needles individually disposed in said needle slots for independent reciprocating movement therein, said reciprocating movement of said needles being between the welt, tuck and knit levels of their knitting stroke, a circle of like pivotally movable levers extending radially outwardly of said circle of needles, each of said levers having a longer and a shorter arm of which the former are individually and operatively related to said needles to move the same, said levers being rockable in one direction to raise said needles and being rockable in the opposite direction to lower said needles thereby to move said needles through their knitting stroke, a circle of like vertically extending and reciprocatingly movable control members individually and operatively related to said shorter arms of said circle of levers to rock the same in said one direction when said control members are moved downwardly, said control members being movable upwardly by said levers when the latter are rocked in said opposite direction, a fixed needle raise cam at each feed of the machine rotatable relative to and in engagement with said circle of control members to move the same downwardly from a first to a second and to a third level thereby to rock said levers accordingly in said one direction and thereby to raise said needles via said levers from welt level to tuck and to knit levels, respectively, a fixed needle lowering cam at each feed of the machine rotatable relative to and in engagement with said longer arms of said circle of levers to rock the same in said opposite direction thereby to lower said needles and at the same time to cause said levers to raise said control members, and pattern controlled means capable of acting upon said circle of control members to disengage selected ones of the latter from contact with said needle raise cam at an earlier and at a later time, certain of said control members being so disengaged from said needle raise cam at an earlier time when they are at their first said level whereby the needles associated with said cetain control members are not raised and remain at their welt level, certain other of said control members being so disengaged from said needle raise cam at a later time when they are at their said second level whereby the needles associated with said certain other control members are raised to and remain at their tuck level, the arms of said levers being so proportioned that said needles are raised and are lowered in their knitting stroke along pathways the angles of which are

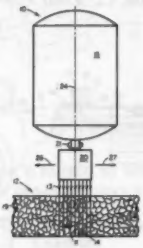
steeper than the angles of the cam faces of said needle raise cam and of said needle lowering cam, respectively.

3,940,951
KNITTING MACHINE CONTROL
Paul Christiansen, Novelty, Ohio, assignor to Hayes-Albion Corporation, Norristown, Pa.
Filed Oct. 27, 1971, Ser. No. 193,047
Int. Cl.[2] D04B *15/78*
U.S. Cl. 66—50 R 12 Claims



8. Knitting machine control apparatus for use in a knitting machine having a plurality of actuators for effecting operation of needles disposed on a needle cylinder to knit a predetermined pattern, said knitting machine control apparatus comprising data storage means for storing a plurality of groups of pattern data each of which relates to a portion of the predetermined pattern and has a unique address, reader means for reading said groups of data, first indicator means for indicating the address of data currently being read by said reader means, second indicator means operatively connected with the knitting machine for indicating the address of a group of pattern data required for knitting a portion of the pattern, and control means for detecting when the address of a group of data to be read by said reader means corresponds to the address of the group of pattern data indicated by said second indicator means as being required for knitting a portion of the pattern and for effecting activation of at least some of said actuators in accordance with the data contained in this group of data, said control means including comparator means for comparing the address of a group of data to be read by said reader means with the address of the group of data indicated by said second indicator means as being required for knitting a portion of the pattern, register means for receiving data signals from said reader means when said comparator means detects that the address of a group data being read by said reader means matches the address of the group of data indicated by said second indicator means as being required for knitting a portion of the pattern, and means for effecting sequential operation of a plurality of said actuators in a timed relationship with rotation of the needle cylinder and in accordance with data signals received from said register means, said register means includes first and second registers each of which is capable of storing one of the groups of pattern data, and gating means for effecting the transmission of a group data from reader means to one of said registers and for contemporaneously therewith effecting the transmission of a group of data from the other of said registers to said means for effecting sequential operation of a plurality of said actuators.

3,940,952
DETECTING ABNORMALITY
Drury K. Mitchell, Columbus, Ohio, assignor to Battelle Memorial Institute, Columbus, Ohio
Filed Oct. 23, 1973, Ser. No. 408,292
Int. Cl.[2] G01N *29/04*
U.S. Cl. 73—67.8 R 11 Claims

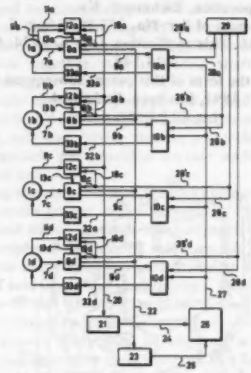


1. In apparatus for detecting a selected type of abnormality in a predetermined region comprising transmitter means for directing an elastic mechanical wave in a series of pulses to portions of the region and receiver means for providing response to the wave pulses reflected therefrom, wherein the amplitudes of pulses reflected from a portion of the region where such type of abnormality is absent (a normal portion) may approximate the amplitudes of pulses reflected from a portion where such type of abnormality is present (an abnormal portion) and thus make it difficult to distinguish between normal and abnormal portions, the improvement comprising
in the transmitter means, mechanical wave radiating means providing an irregular cross-sectional radiation pattern,
means for providing relative transverse repetitive motion between the radiating means and a given portion of the region while a series of pulses are directed to the same portion of the region, superimposed on any scanning movement from portion to portion of the region, to provide randomlike variations in the shapes of successive pulses where reflected from a normal portion of the region differing detectably from any variations caused in successive pulses where reflected from an abnormal portion, and
means responsive to a plurality of successive reflected pulses for effectively superimposing them, the types of wave shapes of the superimposed pulses being indicative selectively of a normal or an abnormal portion of the region.

3,940,953
SYSTEM FOR CENTRALLY CONTROLLING A PLURALITY OF KNITTING MACHINES
Ivo Kouklik, Trebic, Czechoslovakia, assignor to Elitex, Liberec, Czechoslovakia
Filed July 8, 1974, Ser. No. 486,321
Claims priority, application Czechoslovakia, July 12, 1973, 5010-73
Int. Cl.[2] D04B *15/66*
U.S. Cl. 66—154 A 9 Claims

1. Apparatus for individually controlling a plurality of knitting machines, each of which has needle selectors, means for actuating said needle selectors and means for counting both needles and courses for determining the needle position of each of said machines comprising a common patterning memory adapted to be read by a pulse from each of said needle and course counters and to provide a signal for operating each of said needle selector actuating means, a central control device, said central control device having means for providing pulses for the successive switching of said needle and course counters in each machine to said common patterning memory and for simultaneously switching the output of the common pat-

tering memory to the associated needle selector actuating means of each selector at a speed synchronous with a signal



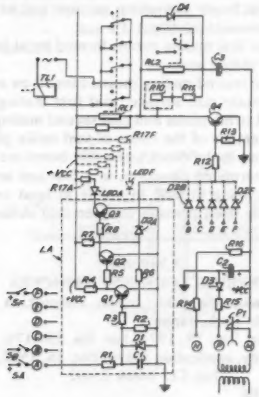
from the needle counter corresponding to the passage of the needles in the associated machine.

3,940,954

ELECTRICAL SUPERVISORY CIRCUIT ARRANGEMENTS

Luciano Romoli, Florence, Italy, assignor to Billi S.p.A., Florence, Italy

Filed July 10, 1974, Ser. No. 487,395
Claims priority, application Italy, July 13, 1973, 9549/70
Int. Cl.²; D04B *35/14, 35/18*
U.S. Cl. 66—157 **6 Claims**



1. An electrical supervisory circuit arrangement for monitoring fault signals produced by fault conditions in a motor-driven machine, comprising a plurality of bistable electronic memory circuits each responsive to a respective one of the fault signals so as to be switched thereby from a RESET to a SET state, means in each memory circuit for rendering it asymmetric whereby it tends to assume said RESET state in the absence of a fault signal,

means connected to each memory circuit to provide a respective visual indication when that memory circuit assumes its SET state,

output means connected in common to all the memory circuits so as to be activated when any one of them assumes the SET state,

first control means connected to the output means and to the power supply for the motor of the machine and responsive to activation of the output means to interrupt the forward-current supply for the motor of the machine,

second control means connected to the output means and to the power supply for the machine and operative for a predetermined time interval in response to activation of the output means to connect a temporary reverse-current electrical supply for the motor to arrest it rapidly, and

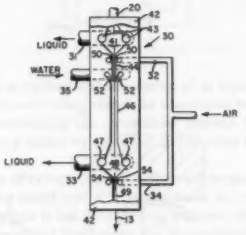
means connected to the memory circuits for resetting them.

3,940,955

YARN EXTRACTION AND WASHING APPARATUS

Paul Bryce Welsh, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Co., Wilmington, Del.

Filed Nov. 26, 1974, Ser. No. 527,348
Int. Cl.² D06B *5/06, 21/02*
U.S. Cl. 68—20 **2 Claims**



1. A yarn extraction and washing apparatus comprising: a body having a passage extending along a straight axis therethrough and through which yarn travels for treatment, said passage including successively a first extraction chamber having means for draining the chamber, a first passage length, a second passage length having a greater cross-sectional area than said first length, a second extraction chamber having means for draining the chamber, said second extraction chamber being followed by a third passage length being equal in cross-sectional area to said first length; a first pair of conduits angularly disposed into the passage at the junction of the first extraction chamber and said first length to provide flow paths into the chamber counter-current with the yarn travel; a second pair of conduits angularly disposed into the passage at the junction between said first and second lengths to provide flow paths into the passage co-current with yarn travel; liquid supply means connected to said second pair of conduits; a third pair of conduits angularly disposed into the passage at the junction of the second extraction chamber and said third length to provide flow paths into the chamber counter-current with yarn travel; and gas supply means connected to the first and third pairs of conduits.

3,940,956

DOOR LOCK

Vincent J. Stevens, 98-15 Horace Harding Expressway, Rego Park, N.Y. 11368

Filed Oct. 23, 1974, Ser. No. 517,195
Int. Cl.² E05B *65/00;* **E05C** *17/32, 17/36*
U.S. Cl. 70—93 **5 Claims**

1. A door lock comprising:

a first base element of high strength, rigid, unitary material and being of thick cross section;

the first base element being L-shaped in configuration with one leg being adapted for fastening the element to the inside of a door frame and the other leg of the first base element extending substantially perpendicular therefrom and having a pivot orifice therethrough;

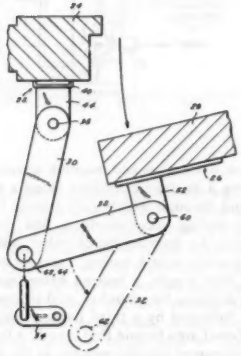
a second base element of high strength, rigid, unitary material and being of thick cross section;

the second base element being L-shaped in configuration with one leg adapted to be fastened to the inside surface of a door adjacent the door frame;

the other leg of the second base element extending substantially perpendicular to the first leg thereof and having a pivot orifice therethrough;

a first arm of high strength, rigid, unitary material and being of thick cross section and having a pivot orifice adjacent one end thereof adapted to be aligned with the pivot orifice in the other leg of the first base element so as to receive a pivot pin inserted through the aligned openings whereby the first arm is free to pivot with respect to the rigidly mounted first base element;

a second arm of high strength, rigid, unitary material and being of thick cross section and having a pivot orifice adjacent one end thereof adapted to be aligned with the pivot orifice in the other leg of the second base element so as to receive a pivot pin through the aligned orifices



thereby pivotally attaching the second arm to the second base element;

fastener receiving surfaces in the end of each arm distal from the pivot orifice therein and the arms being of predetermined rigid length and being of sufficient thickness to resist breaking and the fastener receiving surfaces adapted to be aligned with one another for receipt of a fastener element and locking thereof; and

a fastener element adapted to be removably fastened to the fastener receiving surfaces on the arms so as to rigidly interconnect the arms and lock the door to the door frame while permitting limited movement of the door with respect to the door frame upon pivotal movement of the interconnected arms so that the door can be partially opened and a person from outside of the enclosure can reach the fastener and unlock the fastener and permit the arms to be displaced from one another and the door to be opened and the high strength, rigid, unitary material of thick cross section of the arms and base elements substantially hindering a person from breaking or cutting the lock.

3,940,957

BAR LOCK ASSEMBLY MODIFICATIONS

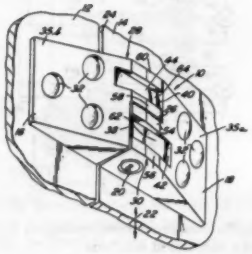
Russell W. Walters, Reading, Pa., assignor to BMR Security Products Corporation, Richmond, Ky.

Continuation-in-part of Ser. No. 277,565, Aug. 3, 1972, Pat. No. 3,827,266. This application Aug. 6, 1974, Ser. No. 495,144

The portion of the term of this patent subsequent to Aug. 6, 1991, has been disclaimed.

Int. Cl.[2] E05B *63/00*

U.S. Cl. 70—104 **15 Claims**



1. A locking bar assembly comprising:

a. a pair of strike plates, each of said strike plates having a respective lug member formed thereon;

b. bar lock means insertable through bores formed within each of said lug members when said bores are aligned in a predetermined direction;

c. each of said lug members having an upper and lower surface passing in a plane substantially normal to an axis direction of said bores, and an outer side surface having at least one larger dimension section and at least one smaller dimension section;

d. at least one first mating means formed by at least one of said strike plates; and,

e. at least one second mating means formed on and shorter than said outer side surface, said first mating means of one of said strike plates and said second mating means of said lug member of the other of said strike plates being received one in the other when said bores are aligned in said predetermined direction, said first and second mating means being formed to define at least one angular substantially fixed position between said strike plates.

3,940,958

STEERING LOCK FOR VEHICLES

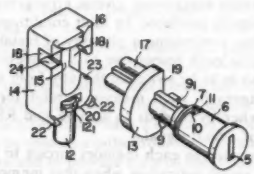
Shigenori Kuroki, Miyazaki, Japan, assignor to Kabushiki Kaisha Honda Lock, Japan

Filed Dec. 19, 1974, Ser. No. 534,174

Claims priority, application Japan, Dec. 26, 1973, 49-4810

Int. Cl.[2] B60R *25/02*

U.S. Cl. 70—186 **3 Claims**



1. A safety lock for steering device in automobile vehicle, which comprises in combination:

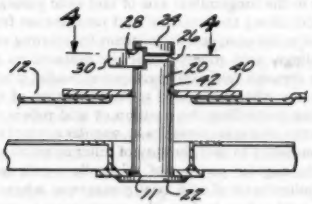
a. a casing for said lock device defining a cavity therein;
b. a cylinder type lock provided in contiguity to said casing and having an outer barrel and an inner barrel, both being arranged concentrically;
c. an operating shaft integrally and concentrically formed with said inner barrel of said cylinder lock in a manner rotatable together, said operating shaft extending into said casing;
d. a circular cam slidably supported on and integrally rotatable with said operating shaft and accommodated in said casing, said cam having therein a notched portion;
e. an eccentric pin provided on one surface part of said circular cam;
f. a sliding member provided with an engagement groove, an escapement groove, and a plurality of engagement members, said sliding member being engaged with and held on the peripheral surface of said circular cam, and being movable in the direction perpendicular to the axial direction of said operating shaft, along a through-hole formed therein in said direction, according as said eccentric pin on said circular cam is allowed to pass along said escapement groove thereof to be engaged with said groove, when said operating shaft is turned to a locking direction, while releasing said sliding member from its engaged relationship with said circular cam by means of said notched portion in said circular cam; and
g. a locking means fitted on one part of said sliding member in a manner to be engageable with a steering shaft at a locking position thereof by the engagement action of said sliding member.

3,940,959

SPARE TIRE LOCK

Edward J. Anderson, 27041 Pinjara Circle, Mission Viejo, Calif. 93452, and Franklin E. Hinze, 3592 Mulford Ave., Lynwood, Calif. 90262

Filed Nov. 20, 1974, Ser. No. 525,292
Int. Cl. E05b *65/12*
U.S. Cl. 70—259 **8 Claims**



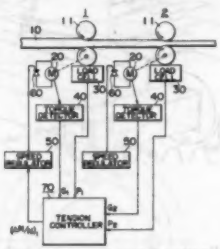
1. A combination spare tire, wheel and lock including: a padlock with a shackle; a mounting post for receiving a spare tire, said post having a base end for securing it and a free end having an adjacent circumferential groove adapted to receive and enclose said padlock shackle; and a mounting plate having a hole smaller than said padlock, but large enough to receive said mounting post; wherein a spare tire on a wheel hub secured by said lock is axially mounted on said post inverted from a conventional mounting so that its most exterior hub portion is adjacent the base end of said post, said mounting plate is on said post adjacent to said spare tire and said padlock with its shackle are locked into said post groove over said mounting plate close enough together that no entry of cutting tools is possible between the aforementioned elements.

3,940,960

INTERSTAND TENSION CONTROL METHOD AND APPARATUS FOR TANDEM ROLLING MILLS

Shinya Tanifuji; Yasuo Morooka, and Masaya Tanuma, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 17, 1975, Ser. No. 541,953
Claims priority, application Japan, Jan. 21, 1974, 49-8588
Int. Cl.² B21B *37/00*
U.S. Cl. 72—19 **15 Claims**



1. In a tandem rolling mill consisting of at least a first rolling stand and a second rolling stand, an interstand tension control method for controlling the interstand tension imparted to a workpiece being rolled by said first and second rolling stands, comprising

the first step of computing the reference torque arm for said first rolling stand and storing the same in a memory after the workpiece is fed into the nip between the rolls of said first rolling stand but before the workpiece is fed into the nip between the rolls of said second rolling stand,

the second step of detecting the respective torque arms at said first and second rolling stands immediately after the workpiece is fed into the nip between the rolls of said second rolling stand and computing the reference torque arm for said second rolling stand on the basis of the torque arm values detected at said first and second rolling stands and the stored reference torque arm value for said first rolling stand for storing the reference torque arm value for said second rolling stand in a memory, and

the third step of detecting the respective torque arms at said first and second rolling stands while the workpiece is being rolled by both said first and second rolling stands and computing the difference between the deviation of the detected torque arm value at said first rolling stand from the stored reference torque arm value for said first rolling stand and the deviation of the detected torque arm value at said second rolling stand from the stored reference torque arm value for said second rolling stand, and controlling the interstand tension imparted to the workpiece moving between said first and second rolling stands to be constant in response to the value of the difference thus computed.

3,940,961

APPARATUS FOR COOLING HOT ROLLED STEEL ROD BY FORCED AIR CONVECTION OR BY SUPPLYING HEAT

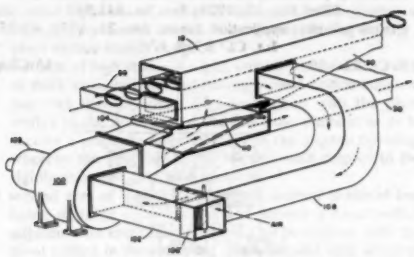
Martin Glivar, Oakham, Mass., assignor to Morgan Construction Company, Worcester, Mass.

Filed Nov. 18, 1974, Ser. No. 524,458
Int. Cl.² B21B *45/02, 45/04;* B21C *43/00;* B21F *21/00*
U.S. Cl. 72—40 **6 Claims**

1. Apparatus for the disposal of scale which breaks away from hot metal while said metal is being cooled slowly under oxidizing conditions, comprising:

a. a conveyor for transporting said metal while it is cooling,
b. a plenum chamber under said conveyor;
c. guide means comprising a passage for guiding scale which breaks away from said metal on said conveyor into said plenum chamber,

d. means for removing said scale from said plenum chamber, and



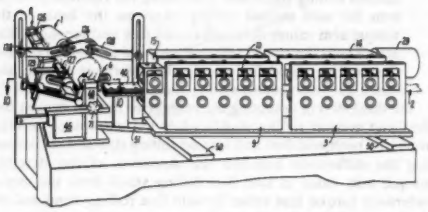
e. scale collection means associated with said plenum chamber for receiving said scale removed from said plenum chamber.

3,940,962

CONDUIT MAKING MACHINE WITH DIAMETER CONTROL AND METHOD

Paul Knight Davis, Alameda, Calif., assignor to Pacific Roller Die Company, Incorporated, Hayward, Calif.

Filed May 9, 1974, Ser. No. 468,622
Int. Cl.² B21C *37/12*
U.S. Cl. 72—50 **8 Claims**



5. In a machine for making spiral, lock seam tubing from an elongated strip of sheet metal including apparatus for forming flanges on the opposed longitudinal edge of said strip, a mill for continuously bending said strip into helical convolutions and guiding said flanges into interlocking relationship, and opposed rollers engaging opposite sides of said flanges for crimping the same into a continuous seam, the improvement comprising:

a. means for simultaneously radially adjusting the position of said opposed rollers relative to the longitudinal axis of said tubing for maintaining the desired diameter of tubing.

7. In a method of making spiral, lock seam tubing from an elongated strip of sheet metal including forming flanges in opposite edges of said strip, bending said strip into helical convolutions, guiding said flanges into interlocking relationship and rollingly crimping said interlocked flanges into a continuous seam, the improvement comprising:

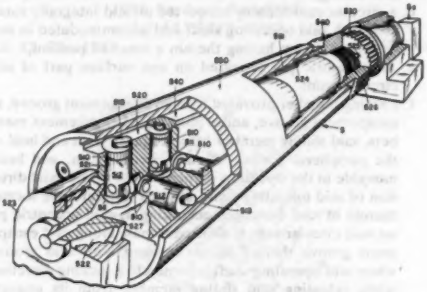
a. controlling the diameter of the tubing by simultaneously adjusting the point at which said crimping occurs radially in relation to the axis of said tubing while at the same time maintaining the relative axial relationship of said flanges.

3,940,963

SELF-COMPENSATING DIE

Daniel J. Borodin, Detroit, Mich., assignor to New York Wire Mills Corporation, Tonawanda, N.Y.

Filed Jan. 20, 1975, Ser. No. 542,397
Int. Cl.² B21B *1/18*
U.S. Cl. 72—78 **39 Claims**



1. Apparatus for reducing the cross section of rod, wire or like material comprising: rotor means having a longitudinally axial passageway therethrough through which material can pass and about which said rotor means is rotatably mounted; a plurality of sets of separate roller assemblies, each set including at least two of said roller assemblies, each of said roller assemblies including a roller mouting means and a roller rotatably mounted on said roller mounting means; each said roller mounting means being generally radially movably mounted in said rotor means whereby its roller can be moved towards or away from the longitudinal axis of said axial passageway; said roller mounting means also being rotatably mounted in said rotor means whereby the angle of orientation of said roller with respect to said axial passageway can be adjusted by rotating said roller mounting means through a particular angle of adjustment; said sets of roller assemblies being mounted in spaced relationship along the length of said rotor means said rollers located contiguous with said axial passageway for engaging material passing therethrough and with said rollers in said sets of roller assemblies being located closer to the longitudinal axis of said axial passageway as one proceeds along the length of said rotor means from the front thereof to the rear; and drive means for rotating said rotor and accordingly said rollers about the material as the material passes through said axial passageway; radial position control means operably connected to said plurality of roller assemblies for controlling the position of said rollers radially with respect to said axial passageway; angular control means operably connected to said plurality of roller assemblies for controlling the angular position of said rollers with respect to the longitudinal axis of said axial passageway whereby the angle which said rollers make with respect to wire passing through said axial passageway can be adjustably controlled.

3,940,964

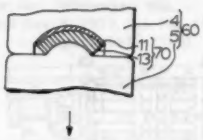
METHOD FOR MAKING A CLAD WIRE FOR AN ELECTRIC CONTACT

Tsunehiko Todoroki, Yamatokoriyama, and Sankichi Shida, Kawanishi, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 1, 1974, Ser. No. 511,466
Int. Cl.² B21C *1/00*
U.S. Cl. 72—177 **8 Claims**

1. A method for making a clad wire for an electric contact comprising the steps of softening a clad tape by annealing, said clad tape comprising a base metal and at least one surface layer of noble metal firmly bonded to said base metal, forming said softened clad tape into a cross sectional shape of a circular arc perpendicular to the longitudinal direction of said clad tape with said noble metal surface layer on the outside periph-

eral surface thereof, and normally cold-drawing said formed clad tape through a wire forming die having a standard section



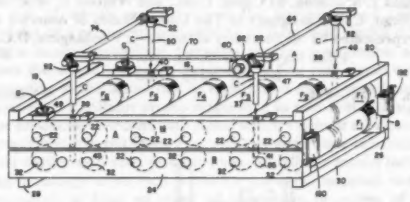
with the noble metal surface layer on the outer surface of the drawn clad tape, whereby there is provided a clad wire which is partially clad with said noble metal as a surface layer.

3,940,965

METHOD AND APPARATUS FOR FORMING CORRUGATING PIPE

Eugene W. Sivachenko, Redding, and Howard G. Pratt, Brownsville, both of Calif., assignors to Eugene Sivachenko, Redding, Calif.

Continuation-in-part of Ser. No. 478,561, June 12, 1974, abandoned. This application Mar. 6, 1975, Ser. No. 555,918
Int. Cl.[2] B21C *37/12*; B21D *5/06*
U.S. Cl. 72—180 19 Claims



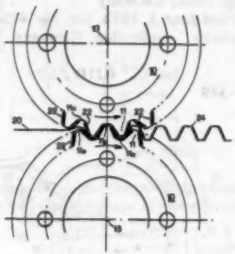
1. In a line mill having a plurality of opposed overlying and underlying working rollers for corrugating a skelp strip passing therebetween, means for forming a longitudinal edge lip extending over the length of the corrugated strip, a power source for driving the rollers to corrugate the skelp, and adjustment means for varying the working dimension between the upper and lower opposed rollers to conform to various dimensions, thicknesses and deformabilities of skelp, the improvement comprising: means for maintaining the width of the lip substantially constant, the last mentioned means including a first frame for supporting all of the overlying rollers; first shaft means fixedly carried by the first frame and mounting the overlying rollers for rotation about an axis of the first shaft means; a second frame for supporting all of the underlying rollers; second shaft means fixedly carried by the second frame and mounting the underlying rollers for rotation about an axis of the second shaft means; adjustment means for urging the first and second frame members with the respective attached overlying and underlying rollers towards one another; and means for simultaneously and identically operating the adjustment means to move the respective frame sections towards and away from one another to produce simultaneous and identical adjustment between all of the overlying and underlying rollers whereby the activation of the operating means moves the frame sections towards or away from each other to compensate for skelp strip width variations and to thereby maintain the lip width constant irrespective of such variations in the skelp width.

3,940,966

APPARATUS FOR SHAPING SHEET MATERIAL

Norman Philip Deane, Rugby, England, assignor to Covrad Limited, Coventry, England

Filed Dec. 2, 1974, Ser. No. 528,815
Claims priority, application United Kingdom, Dec. 5, 1973, 56412/73
Int. Cl.[2] B21D *13/04*
U.S. Cl. 72—196 11 Claims



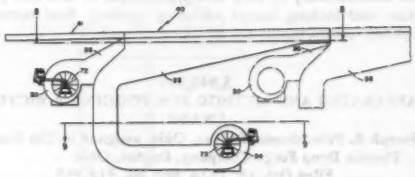
1. Apparatus for shaping sheet material, comprising two co-operating rollers each having profiled surfaces, the rollers being arranged to receive sheet material between the profiled surfaces during rotation of the rollers for forming the material into a shape dictated by the shape of the profiled surfaces, the profiled surfaces being shaped to include teeth and each tooth having flanks, the flanks being shaped to include raised portions to impart a corresponding pattern on the material, and resilient means being provided along portions of the flanks of the teeth for urging the sheet material away from the teeth after a shaping operation.

3,940,967

APPARATUS FOR CONTROLLED COOLING HOT ROLLED STEEL ROD IN DIRECT SEQUENCE WITH ROD MILL

Vito J. Vitelli, Shrewsbury, Mass., assignor to Morgan Construction Company, Worcester, Mass.

Filed Jan. 10, 1975, Ser. No. 539,984
Int. Cl.[2] B21B *45/02*, *43/00*
U.S. Cl. 72—201 5 Claims



1. An apparatus for treating hot steel rod comprising:
a. an elongated cooling conveyor;
b. a conveyor adapted to receive hot steel rod in the form of spread-out rings and for moving said rings along said cooling conveyor;
c. said cooling conveyor being provided with a plurality of edge nozzles disposed adjacent the path traversed by the edges of said rings, and with a plurality of center nozzles disposed adjacent the path traversed by the centers of said rings;
d. first blowing means for supplying cooling gas to said edge nozzles for producing ring edge cooling gas streams, and second blowing means for supplying cooling air to said center nozzles for producing ring center cooling gas

streams, said first and second blowing means being independent of each other;

e. said nozzles being oriented to produce gas streams along nonintersecting paths.

3,940,968

DEVICE FOR MAKING HOLLOW BODIES

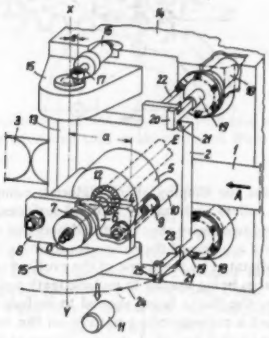
Heinrich Hennes, and Walter Sommer, both of Essen, Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed June 3, 1974, Ser. No. 475,807

Claims priority, application Germany, June 8, 1973, 2329241

Int. Cl.² B21D *22/20*

U.S. Cl. 72—349 **2 Claims**



1. A device for making hollow bodies open at one end, especially by punching and deep drawing, which includes in combination: frame means provided with extension means, plate means for receiving and supporting annular tools for manufacutring the desired hollow body, connecting means connected to said plate means and pivotally journalled in said extension means, and actuating means operatively connected to said connecting means for pivoting said plate means with the annular tools thereon selectively from a first position in which the tools occupy their position of use to a second position for exchanging and repairing any one of the tools, and vice versa, said actuating means including a fluid operable cylinder-piston system for pivoting thereof and locking means for automatically locking said plate means in said first position, said locking means including pressure fluid operable cylinder-piston means for actuation thereof.

3,940,969

APPARATUS AND METHOD FOR FORGING A BICYCLE CRANK

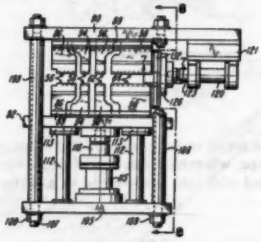
Joseph B. Princehouse, Dayton, Ohio, assignor to The Harris-Thomas Drop Forge Company, Dayton, Ohio

Filed Oct. 18, 1974, Ser. No. 515,995

Int. Cl.² B21K *1/08*

U.S. Cl. 72—354 **6 Claims**

1. An improved method for producing a forged bicycle crank including generally parallel crank arms projecting in opposite directions from an integrally connecting center axle portion, comprising the steps of heating an elongated metal rod, inserting the metal rod into a set of axially spaced dies defining a plurality of enlarged cavities disposed axially inwardly from opposite elongated end portions of the rod, gripping the rod with said dies, moving said dies axially together to forge a corresponding plurality of intermediate portions of the rod outwardly into said cavities and to form a plurality of outwardly projecting and axially spaced enlarged intermediate bosses on the rod between the opposite elongated end portions of the rod, bending the rod adjacent two of said enlarged intermediate bosses to form a first crank arm from one of said end portions of the rod and a second crank arm from the other said end portion of the rod and with said crank arms integrally



connected by a center axle portion having two of said enlarged intermediate bosses, and forming bearing support surfaces on said enlarged intermediate bosses of said center axle portion.

3,940,970

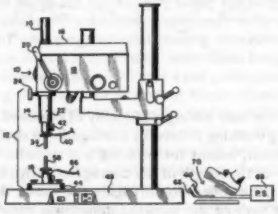
EYELETTING ATTACHMENT FOR DRILL PRESSES

Leonard G. Terral, Ridgecrest, Calif.; Ephraim Regelson, Kensington, Md.; William E. Sake, Ridgecrest, Calif.; Ronald J. Matusiak, El Cajon, Calif., and William L. Rea, San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 12, 1975, Ser. No. 576,941

Int. Cl.² B21J *13/02*

U.S. Cl. 72—416 **7 Claims**



1. An eyeletting attachment for a conventional drill press having a horizontal base, a column, a vertically adjustable head supported on said column, and a manually actuated, vertically movable quill mounted in said head, the attachment comprising:

upper and lower tool holder assemblies;

said upper tool holder assembly having means for detachably securing to the lower end of said quill;

means on said upper tool holder assembly for vertically supporting one of a pair of ram eyeletting tools;

said lower tool holder assembly comprising a base member having means for anchoring to the base of said drill press in a vertically aligned position with the upper tool holder assembly;

means mounted on said base member for vertically supporting the other ram eyeletting tool of said pair of tools;

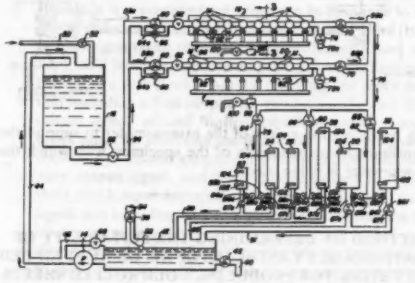
whereby the quill of the drill press may be manually lowered to peen an eyelet to its supporting plate between the ends of the eyeletting ram tools.

3,940,971

SYSTEM FOR TESTING FLOW METERS

Marvin W. Krause; Donald H. Strobel, both of Cedarburg, and Edward A. Seruga, Milwaukee, all of Wis., assignors to Badger Meter, Inc., Milwaukee, Wis.

Filed Nov. 1, 1973, Ser. No. 411,712
Int. Cl.² G01F 25/00
U.S. Cl. 73—3 9 Claims



1. Apparatus for testing a flow meter comprising: means for establishing a flow of fluid through the meter being tested at a predetermined rate; a receptacle for said fluid; quantitative sensing means associated with said receptacle for generating a pair of signals respectively at the beginning and end of receipt of a predetermined volume of fluid, said signals defining a measuring interval; transducer means positionable adjacent the tested meter for producing a first rate signal corresponding to the actual rate of registration of the tested meter; controlled oscillator means responsive to said first rate signal for producing a second rate signal which varies at a frequency proportional to but at least an order of magnitude in excess of said registration rate, said controlled oscillator means including a voltage controlled oscillator having a nominal output frequency at least an order of magnitude in excess of the frequency of registration of said meter, frequency division means coupled to said oscillator for dividing said second rate signal in frequency to produce a phase reference signal having a frequency approximating the desired frequency for said first rate signal, a phase detector for receiving said first rate signal and said phase reference signal and for providing an output signal varying with the difference in phase between said first rate signal and said phase reference signal, and means responsive to said phase detector output signal to provide an oscillator control signal the voltage of which varies with said phase difference to increase or decrease, respectively, said oscillator output frequency as the frequency of said first rate signal becomes greater or less than the frequency of said reference signal; counting means controlled by said quantitative sensing means for counting the cycles of said second rate signal occurring during said measuring interval; and an output device for indicating the count in said counting means at the end of said measuring interval.

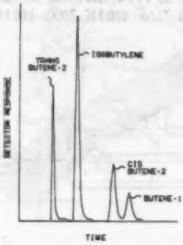
3,940,972

CHROMATOGRAPHIC SEPARATION OF OLEFINS

John R. Norell, and Lloyd E. Gardner, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed June 28, 1974, Ser. No. 484,270
Int. Cl.² G01N 31/08
U.S. Cl. 73—23.1 14 Claims

1. The method of analyzing a mixture containing olefins which comprises introducing a sample of the mixture to be analyzed into a chromatographic column containing silver trifluoromethanesulfonate, passing a carrier fluid through the column to elute sequentially the olefin constituents of the



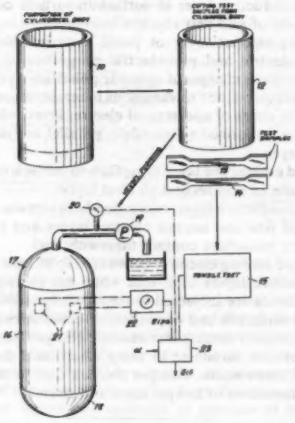
sample, and measuring a property of the column effluent which is representative of changes in composition thereof.

3,940,973

METHOD FOR THE DETERMINATION OF SHRINKAGE EFFECT

Alexandru Ioan Muscan, Bucharest, Romania, assignor to Institutul de Cercetari si Proiectari Pentru Utilaj Chimic si Rafinarii, Bucharest, Romania

Filed Mar. 11, 1974, Ser. No. 449,838
Int. Cl.² G01N 3/12
U.S. Cl. 73—88 R 1 Claim



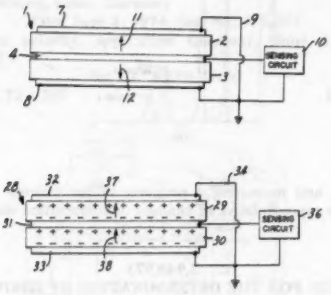
1. A method of determining the shrinkage effect for a high-pressure cylindrical vessel in the body of which a shrinkage effect ϵ_{sf} is induced, comprising subjecting a plurality of standard test samples from said body to tensile stress to determine the strain ϵ_p at the proportionality limit; applying strain gauges to said body and pressurizing the same with a fluid to determine the hoop strain ϵ_{tpa} at the apparent proportionality limit; deriving the strain intensity ϵ_{pa} at the apparent proportionality from the hoop strain ϵ_{tpa} corrected by a coefficient determined by the vessel shape, and determining the hoop strain ϵ_{sf} as the difference between ϵ_{pa} and ϵ_p.

3,940,974

ELECTRICALLY COMPENSATED SENSOR

Allen L. Taylor, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 6, 1974, Ser. No. 467,014
Int. Cl.² G01B 7/16; G01K 7/00; H01G 7/02
U.S. Cl. 73—88.5 R 6 Claims



1. An electret sensing device that is subjected to both temperature and stress variations and is employed for sensing one of said variations and ignoring the other of said variations, which device comprises:

a first electret layer of poled material that has both piezoelectric and pyroelectric properties and develops electrostatic charges of opposite polarities on its surfaces in correspondence to variations in temperature and variations in stress of said first electret layer;

a first conductive layer in surface-to-surface contact with one side of said first electret layer;

a second electret layer of poled material that has both piezoelectric and pyroelectric properties and develops electrostatic charges of opposite polarities on the surfaces in correspondence to variations in temperature and variations in stress of said second electret layer, which second layer is positioned substantially parallel to said first electret layer;

a second conductive layer in surface-to-surface contact with one side of said second electret layer;

a third conductive layer interposed between the other sides of said first and second electret layers and in electrical surface-to-surface contact therewith; and

electronic sensing circuitry connected to at least two of said conductive layers such that when the electret layers of said device are subjected to substantially uniform temperature variations and oppositely directed stress variations, said circuitry detects electrostatic charges thereon due to one of said variations in temperature and stress and ignores electrostatic charges thereon due to the other of said variations of temperature and stress.

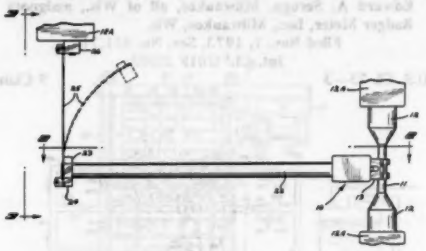
3,940,975

EXTENSOMETER SUPPORT

Harry R. Meline, Minneapolis, Minn., assignor to MTS Systems Corporation, Minneapolis, Minn.

Filed Sept. 9, 1974, Ser. No. 504,154
Int. Cl.² G01N 3/02
U.S. Cl. 73—103 11 Claims

9. A method of supporting an extensometer with respect to a test frame applying force to a specimen with which an extensometer is to be used comprising supporting an extensometer on a support arm extending generally at right angle to the direction of force applied to a specimen with which the extensometer is to be used, and supporting said support arm at a location spaced from an extensometer supported on the support arm with a flexible resilient elongated member configured to provide a resilient force on the support arm substantially balancing the weight of the extensometer to support the extensometer independently of the specimen with which the extensometer is being used.



3,940,976

METHOD OF DETERMINING THE SUITABILITY OF CONTINUOUSLY CAST SLABS OF AL- OR AL-SI-KILLED SOFT STEEL FOR PRODUCING COLD ROLLED SHEETS TO BE TINNED

Thorwald Fastner, Linz, Austria, assignor to Vereinigte Osterreichische Eisen- und Stahlwerk-Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Mar. 14, 1975, Ser. No. 558,327
Claims priority, application Austria, Mar. 18, 1974, 2194/74
Int. Cl.² G01N 19/08
U.S. Cl. 73—104 3 Claims

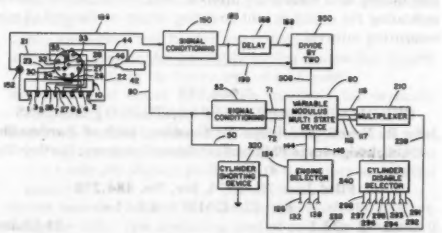
1. A method of determining the suitability of continuously cast slabs of Al- or Al-Si-killed soft steel for producing cold rolled sheets to be tinned, comprising taking a transverse sample of a length of between 50 and 150 mm by making parallel cuts perpendicular to the thickness of the strand and making a slanting cut in the sample, which cut starts from one end of the sample from the surface thereof and is 30 mm deep at the other end of the sample, thus creating a slanting cut area, subsequently making a Baumann print of the slanting cut area showing inclusion clouds present as brown spots, thereupon planimetering the whole inclusion-clouds-area and putting the planimetered area in mm^2 in relationship to the slanting cut area in dm^2.

3,940,977

SIGNAL DISABLING ENGINE DIAGNOSING APPARATUS

Zoltan Voross, Elgin; James R. Caruth, Des Plaines, and Yam C. Leung, Blommingdale, all of Ill., assignors to Sun Electric Corporation, Chicago, Ill.

Filed July 17, 1974, Ser. No. 489,415
Int. Cl.² G01L 3/26
U.S. Cl. 73—116 9 Claims



1. In a system for diagnosing an engine including a source of periodic cycles of ignition signals, improved apparatus for

preventing one or more predetermined ignition signals in each cycle from energizing engine components which are normally energized by said predetermined ignition signals comprising in combination:

input means for receiving said periodic cycles of ignition signals from said source;

generating means for generating a clock pulse in response to the receipt of each ignition signal by the input means;

bistable means for generating first, second and third binary output signals each having an initial state and for changing the state of at least one of the said binary output signals in a predetermined sequence in response to each clock pulse so that said first, second and third binary output signals can represent eight different binary numbers, said bistable means comprising first flipflop means including a first clock input for receiving the clock pulses and including a first output for producing the first binary output signal, second flipflop means including a second clock input for receiving the first binary output signal and including a second output for producing the second binary output signal, and third flipflop means including a third clock input for receiving the second binary output signal and including a third output for producing the third binary output signal;

setting means for initially setting the binary output signals to said initial states by use of a setting pulse generated in response to the operation of a predetermined one of said engine components;

gating means responsive to predetermined states of the first, second and third binary output signals and the clock pulses for returning said binary output signals to their initial states prior to the receipt of said setting pulse, said gating means comprising first gate means for normally transmitting the first binary output signal to the second clock input and for blocking the transmission of the first binary output signal to the second clock input in response to a mode signal, second gate means for normally transmitting the second binary output signal to the third clock input and for transmitting the first binary output signal to the third clock input in response to the mode signal, means for producing the mode signal in response to an enable signal and the third binary output signal and for terminating the mode signal in response to the termination of the third binary output signal or the termination of the enable signal, and means for normally inhibiting the enable signal and for producing the enable signal when the source generates six ignition signals per cycle;

adjustable selecting means for producing a disabling pulse in response to predetermined states of the first, second and third output signals; and

disabling means responsive to the disabling pulse for preventing any simultaneously occurring ignition signal from energizing an engine component, whereby the first, second and third output signals are in the same state each time a predetermined one of the engine components is prevented from being energized.

3,940,978

MOTORCYCLE DYNAMOMETER

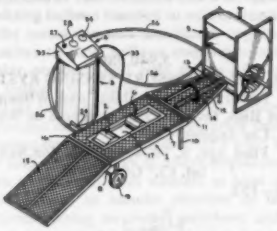
James William Akkerman, 1902 Mermaid Lane, Houston, Tex. 77058, and Jon Derek Akkerman, 809 Mississippi, South Houston, Tex. 77587

Filed Sept. 13, 1974, Ser. No. 505,658
Int. Cl.[2] G01L *5/13*
U.S. Cl. 73—117 **18 Claims**

15. A method of determining horsepower developed by a motorcycle comprising the steps of:

placing the driven wheel of the motorcycle between a pair of independently mounted roller members for engagement therewith, one of said roller members being attached to a positive displacement pump;

applying the power of the motorcycle to said one roller to operate said pump;



sensing the discharge pressure of said pump;

sensing the speed of said other roller member;

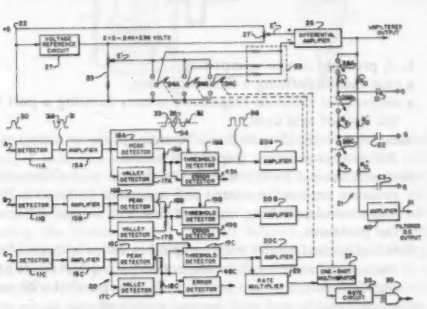
correlating said pump discharge pressure with said speed of said other roller member to calculate the horsepower developed by said motorcycle at said speed.

3,940,979

HIGH-ACCURACY OPTICAL TORQUEMETER

John E. Ward, Lexington; John O. Silvey, Arlington, and James K. Roberge, Lexington, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Oct. 11, 1973, Ser. No. 405,612
Int. Cl.[2] G01L *3/06*
U.S. Cl. 73—136 A **27 Claims**



1. Apparatus for measuring torque transmitted by a rotating shaft, that comprises: a pair of closely, axially spaced regions along the shaft at each of which is located a disc containing at the same radial distance from the axis of the shaft a series of contiguous areas of different radiation-transmitting characteristics with a sharply defined edge between adjacent areas; means for sensing the relative angular displacement between the areas of the disc at one region from the areas of the disc at the other region and operable to produce at least three primary electric signals, each primary electric signal being a series of pulses whose width is related to said angular displacement, the angular displacement from a zero-torque position being a function of the torque transmitted by the shaft, said means for sensing comprising at least three sources of radiation positioned to direct radiation through the radiation-transmitting areas of one disc and then through the radiation-transmitting areas of the other disc, at least three radiation detectors, one associated with each source of radiation, positioned to receive the radiation from the associated source of radiation after it has passed through radiation-transmitting areas of both discs, each detector being operable to provide said series of electric pulses as a pulse train, a unitary mechanical element that holds each radiation source and associated radiation detector in rigid mechanical relationship to one another, the

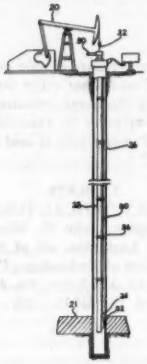
at least three sources of radiation and associated detectors being positioned substantially symmetrically about the disc; and means for combining the pulse trains from the three detectors to provide an averaged output signal representative of torque.

3,940,980

OIL WELL PRESSURE SENSING SYSTEM

Homer G. Tasker, Sherman Oaks, and William F. Green, Woodland Hills, both of Calif., assignors to Whittaker Corporation, Los Angeles, Calif.

Filed Apr. 8, 1974, Ser. No. 458,844
Int. Cl.² G01L 7/06
U.S. Cl. 73—152 **13 Claims**



1. A pressure sensor comprising;
a case means defining a first enclosure,
a differential pressure responsive means forming a part of the wall of said case,
means for responding to the differential pressure across said differential pressure responsive means,
first and second switch means coupled to said differential pressure responsive means and operative to provide first and second switching signals at first and second differential pressures,
first and second diodes each coupled in series with said first and second switch means respectively, said first diode and said first switch means being coupled in parallel with said second diode and said second switch means to form a network forming first and second circuit means respectively, said network being coupled to first and second electrical connections, said network having predeterminedly different electrical characteristics when measured between said first and second electrical connections with the respective switch means closed; and
means for coupling said first electrical connection to a cable conductor.

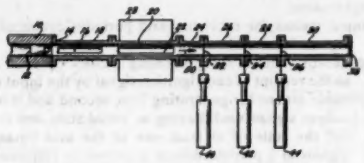
3,940,981

PROJECTILE RECOVERY SYSTEM WITH QUICK OPENING VALVES

William B. Covey, Long Beach; John R. Mastandrea, Los Angeles, and Robert N. Teng, Inglewood, all of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Nov. 5, 1973, Ser. No. 412,990
Int. Cl.² G01L 5/14
U.S. Cl. 73—167 **5 Claims**

1. A projectile recovery system with quick opening valves comprising:
a plurality of tubes connected together to form a path through which a fired projectile passes,
quick opening valve gates having a first position across said path to close the tubes for pressurization, and a second position out of said path to permit passage of said projectile into pressurized tubes without striking said gates, and



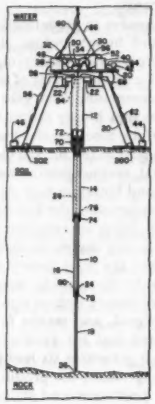
valve actuator means responsive to controlled signals applied thereto for sequentially moving therefor, said valve gates from their first position to their second position.

3,940,982

SUBBOTTOM ROCK MAPPING PROBE

Melvin C. Hironaka, Camarillo, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 16, 1974, Ser. No. 506,372
Int. Cl.² G01W 1/00
U.S. Cl. 73—170 A **8 Claims**



1. A subbottom rock mapping probe for measuring the thickness of a sediment layer located on the bottom of a body of water as well as the depth of the surface of the bottom sediment layer below the water surface comprising:
a. support means;
b. a telescoping probe comprising an elongate outer tube gimbally attached to said support means at a first end, an elongate inner tube having first and second opposite ends, a plurality of successively smaller diameter elongate tubes between said inner tube and said outer tube, said plurality of tubes being nested together in such manner that they will automatically extend downward in telescoping fashion when the force of gravity is applied thereto, said inner tube having the smallest diameter and being the last tube in said telescoping configuration, said telescoping probe being capable of automatically extending downward from an initial position along the vertical as a result of the force of gravity being exerted thereon;
c. a nozzle connected to said elongate inner tube at said second end;
d. means for forcing water through said elongate inner tube and said nozzle whereby the sediment impeding the automatic downward movement of said telescoping probe is dispersed; and

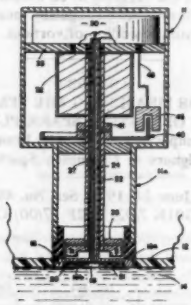
e. means for controlling the movement of said telescoping probe.

3,940,983

FARADAY EFFECT FLUID FLOW AND DIRECTION INDICATOR

Leonard M. Greene, Chappaqua, N.Y., assignor to Safe Flight Instrument Corporation, White Plains, N.Y.

Filed Mar. 19, 1975, Ser. No. 559,675
Int. Cl.[2] G01P 5/08
U.S. Cl. 73—181 15 Claims



1. A Faraday effect device for providing indications as to the speed and direction of the flow of a fluid relative to a body on which the device is mounted, comprising:

a support structure mounted on said body,

a pair of electrodes mounted on said support structure and positioned in said fluid,

a permanent magnet rotatably mounted on said support structure in proximity to said electrodes,

means for rotatably driving said magnet so as to generate a rotating magnetic field in said fluid, whereby an alternating current is developed between said electrodes having a magnitude and phase in accordance with the speed and direction respectively of fluid flow relative to said body,

reference signal generating means for generating first and second electrical reference signals having the same frequency as said rotating magnetic field and predetermined phase relationships relative to each other and to the rotating magnetic field,

first and second phase detectors,

means for feeding the output of said electrodes as an input signal to both of said detectors,

means for feeding said first and second reference signals as reference signals to said first and second detectors respectively, and

indicator means responsive to the outputs of said detectors for providing an indication of the speed and direction of the fluid flow.

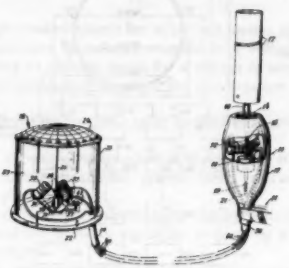
3,940,984

MEANS FOR CONTROLLING THE DISPLACEMENT OF A UNIVERSALLY PIVOTED MEMBER

John Anderson Oram, Leighton Buzzard, England, assignor to Ferraris Development and Engineering Company Limited, London, England

Continuation of Ser. No. 192,102, Oct. 26, 1971, abandoned. This application Nov. 14, 1973, Ser. No. 415,644
Int. Cl.[2] G01W 1/04; G01P 5/04
U.S. Cl. 73—189 6 Claims

1. A device for indicating at least one of two wind characteristics, namely, wind speed and wind direction and comprising: a measuring unit having an elongated universally pivoted member comprising a rod, a counterweight supported by a first end of the rod and an elongate member supported by a second end of the rod, the elongate member being adapted to be exposed to the wind; a display unit having an elongated universally pivoted member which serves as an index, and a scale of at least one of wind direction and wind speed; a plurality of transmitting bellows coupled to said universally pivoted member of the measuring unit in different angular positions, an equal number of slave bellows coupled to said index at similar angular positions and pipe means connecting each transmitting bellows to a slave bellows so that distortion of said transmitting bellows caused by angular movement of the universally pivoted member of said measuring unit when the elongate member thereof is acted upon by a wind load causes distortion of said slave bellows to effect displacement of the index relative to the scale; and wherein at least one of said units further includes an annular member of flexible and resilient material having an outer periphery and an inner periphery and constituting a universal pivot for said universally pivoted member, with said first and second ends of said universally pivoted member being on opposite sides of said pivot; a tension member; means coupling a first end of said tension member to the first end of said universally pivoted member; an anchorage means for the second end of said tension member holding said second end of said tension mem-



ber against movement about said universal pivot, said second end of said tension member being more remote from said universal pivot member than the first end thereof, resilient means exerting a tension force on said tension member; adjustment means connected to said anchorage means for adjusting the force exerted by said tension member on said universally pivoted member; means for temporarily holding said universally pivoted member of said measuring unit in a central position; a fixed mounting for said annular member; and means locating the outer periphery of said annular member with respect to said fixed mounting, with said inner periphery of said annular member engaging said universally pivoted member; the arrangement being such that the universal pivot and the first and second ends of said tension member are in a straight line when the universally pivoted member is in a central position and angular movement of said universally pivoted member in any direction from said central position due to a wind load upon said elongate member of the universally pivoted member of the measuring unit stresses said resilient member to provide a first restoring force and distorts said annular member to thereby create a second restoring force which together with said first restoring force acts on said universally pivoted member to tend to restore it to its central position.

3,940,985

FLUID FLOW MEASUREMENT SYSTEM FOR PIPES

John S. Wyler, W. Chester, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

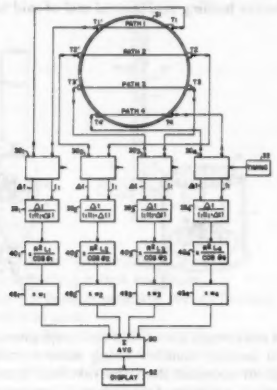
Filed Apr. 18, 1975, Ser. No. 569,630
Int. Cl.[2] G01F 1/66
U.S. Cl. 73—194 A 5 Claims

1. Flowmeter apparatus for measuring volumetric flow rate in a pipe of radius R, comprising:

a. means for obtaining measurements indicative of average fluid velocity along n paths in said pipe;
b. means for modifying said measurements including the application of weighting factors w_i;
c. means for summing said modified measurements;
d. each said path being positioned such that the projection of the path onto a reference plane perpendicular to fluid flow in said pipe is located at a distance of Rx_i from the center of said pipe;
e. where:
i is a particular path number,

$$w_i = \frac{\pi}{n+1} \sin^2 \frac{i\pi}{n+1}, \text{ and}$$

$$x_i = \cos \frac{i\pi}{n+1}.$$

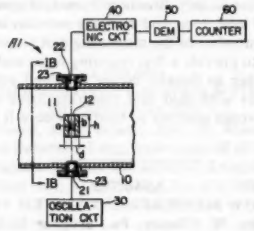


3,940,986

FLOW VELOCITY MEASURING DEVICE

Hiroo Yamasaki; Ichizo Ito, and Yukitake Shibata, all of Musashino, Japan, assignors to Yokogawa Electric Works, Ltd., Tokyo, Japan

Filed Apr. 22, 1975, Ser. No. 570,363
Claims priority, application Japan, Apr. 30, 1974, 49-49111
Int. Cl.² G01F 1/32
U.S. Cl. 73—194 VS 21 Claims



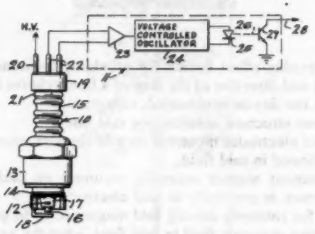
1. Flow metering apparatus of the type having a vortex generation element with a generally elongate cylindrical shape placed transversely in a stream of fluid to produce on opposite sides of the element vortices which are shed in alternating fashion, and having means for measuring the frequency of vortex production to determine the velocity of the fluid stream, the flow metering apparatus being characterized in that:
the vortex generation element is formed with openings at said opposite sides which are connected together by passageway means through the interior of the element to produce therein an alternating fluid flow corresponding to the alternating shedding of vortices; and
the vortex generating frequency measuring means includes an ultrasonic generator and an ultrasonic receiver mounted on opposite sides of the element to propagate an ultrasonic signal from the generator through the passageway means to the receiver to be modulated by the alternating fluid flow in the passageway means corresponding to the alternating shedding of vortices.

3,940,987

APPARATUS FOR MEASURING THE TEMPERATURE OF AN OPERATING SPARK PLUG

Sam J. Green, Temperance, Mich., and Frank J. Raeske, Curtice, Ohio, assignors to Champion Spark Plug Company, Toledo, Ohio

Filed June 24, 1974, Ser. No. 482,327
Int. Cl.² G01K 7/02; F02P 17/00; G08C 9/06
U.S. Cl. 73—346 10 Claims



1. Apparatus for measuring the temperature of a spark plug while such spark plug is operated in a running internal combustion engine which includes an ignition system for periodically applying a high voltage ignition pulse to fire the spark plug, said apparatus comprising, in combination, a thermocouple mounted for measuring the temperature of the spark plug, said thermocouple generating a DC voltage which varies as a function of the spark plug temperature, voltage controlled oscillator means for generating a first signal having a frequency controlled in response to the DC thermocouple voltage, means responsive to such first signal for emitting pulsating light at the controlled frequency, photoelectric detecting means responsive to the emitted light for generating a second signal having the controlled frequency, said detecting means being electrically insulated from said oscillator means and said light emitting means, and means responsive to such second signal for indicating the temperature measured by said thermocouple.

3,940,988

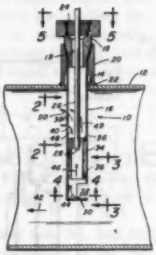
VELOCITY THERMOCOUPLE

Robert D. Reed, Tulsa, Okla., assignor to John Zink Company, Tulsa, Okla.

Filed Mar. 11, 1974, Ser. No. 449,775
Int. Cl.² G01K 13/02
U.S. Cl. 73—349 5 Claims

1. An improved sensor for measuring the temperature of a flowing stream of hot gas in a closed pipe comprising:
a. a first thin-walled tubular metal conduit removably secured at one end from the exterior of said pipe and projecting transversly across the path of said gas flow, said first conduit essentially closed at the other end, a not

more than 180° lower opening on the upstream side of said first conduit adjacent said other end, an upper opening on the downstream side of said first conduit adjacent said one end whereby a portion of said flowing stream of hot gas is transversly diverted in flow into said lower opening upwardly through said first conduit, thence outward back into said flowing stream through said upper opening;



b. temperature sensitive means axially positioned inside said conduit between said upper and lower openings and removably secured from the exterior of said pipe; and

c. at least one thin-walled metal cylindrical open end tube of lesser diameter than said conduit, positioned co-axially in said first conduit between said lower and upper openings and surrounding said temperature sensitive means, with annular spaces for gas flow between said tube and said conduit.

3,940,989

BRAKE POWER CONTROLLING DEVICE

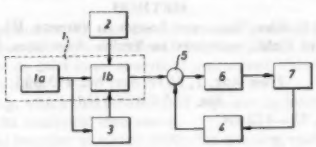
Marten Engerstam, Kopmansvagen 42, Huddinge, Sweden (S-141 41)

Filed Apr. 15, 1974, Ser. No. 460,721

Claims priority, application Sweden, Apr. 19, 1973, 7305593

Int. Cl.² G01L 5/02

U.S. Cl. 73—379 **18 Claims**



1. Brake equipment for controlling a braking power applied to a power source, said brake equipment having brake power setting means comprising means for selectively maintaining either a constant braking power or a programmed variable braking power for said brake equipment, non-electronic means for comparing two r.p.m., first means for producing a first one of said r.p.m. with a definite and functional relationship with the power from said source actually existing in said brake equipment, and second means for producing the second of said r.p.m. with a definite and functional relationship with the desired power of said brake equipment, said comparing means comprising means for delivering an output signal in the form of a third r.p.m. constituting a distinct measurement of the difference between said first and said second r.p.m., and means responsive to the output signal from said comparing means for controlling said brake power setting means to adjust the braking power of said brake equipment such that the desired and the existing powers are brought into accordance.

3,940,990

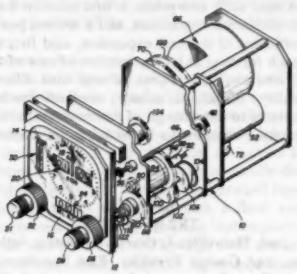
FLIGHT INSTRUMENT

James R. Younkin, Fayetteville, Ark., assignor to Edo-Aire Mitchell Industries, Inc., Mineral Wells, Tex.

Filed Mar. 25, 1974, Ser. No. 454,305

Int. Cl.² G01L 7/12

U.S. Cl. 73—387 **14 Claims**



1. In a flight control system for an aircraft having an altitude responsive pressure transducer coupled to a voltage source and generating an altitude signal for a change in aircraft altitude from an established set point, the combination comprising:

first circuit means for generating an indicated altitude signal,

means for adjusting the set point of the pressure transducer and including means for generating a selected atmospheric pressure signal,

second circuit means responsive to the indicated altitude signal and the pressure signal for generating a pressure altitude signal,

an altitude error correcting circuit responsive to the pressure altitude signal for generating an electrical signal having a wave shape to correct for errors resulting from operation of the pressure transducer,

third circuit means responsive to the electrical signal and connected to the voltage source for generating an altitude correction signal, and

control means responsive to the altitude correction signal and coupled to an indicated altitude display to present a visual reading of aircraft altitude.

3,940,991

BAROMETER GAS PRESSURE MEASURING APPARATUS

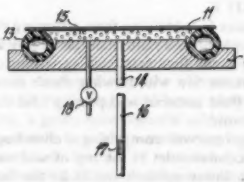
Rudiger Günttner, Heinrichstrasse 47, 45 Osnabruck, Germany

Filed Feb. 4, 1974, Ser. No. 439,069

Claims priority, application Germany, Feb. 8, 1973, 2306062

Int. Cl.² G01L 19/02, 7/00

U.S. Cl. 73—393 **14 Claims**



1. A gas pressure measuring apparatus comprising a tank filled with a pre-set quantity of a gaseous sensory medium, the

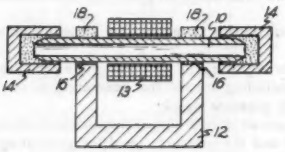
volume of which is utilized for the measurement of a gas pressure, said tank having at least one aperture formed in a wall thereof, movable indicating means having a first end portion and a second end portion, said first end portion being received by said aperture so that said movable indicating means cooperates with said gaseous sensory medium, and said second end portion open to and cooperating with the ambient gas outside of said tank, the pressure of which is to be measured, and said tank comprises a first portion having a low coefficient of thermal expansion, and a second portion having a high coefficient of thermal expansion, said first and second portions each forming at least a portion of one of the walls of said tank, whereby the volume of said tank filled with said pre-set quantity of gaseous sensory medium can be varied in correspondence to any change of ambient temperature of said sensory gaseous medium so as to keep the pressure thereof constant.

3,940,992

TRANSDUCER

Ernest M. Jost, Plainville; Arthur L. Reenstra, Attleboro, both of Mass., and George Trenkler, East Providence, R.I., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 26, 1973, Ser. No. 427,943
Int. Cl.² G01L 9/16
U.S. Cl. 73—398 R **17 Claims**



1. A pressure sensor comprising:
a member having a longitudinal axis composed of magnetic material, the member having first and second ends,
an electrical coil disposed about the member intermediate the ends thereof,
a generally U-shaped yoke having first and second legs connected by a bight portion, the legs having free distal end portions in magnetic communication with the member, slots are provided in the free distal ends of the first and second legs of the yoke and the member is received in the slots, and
means to provide an axial force along the longitudinal axis of the member.

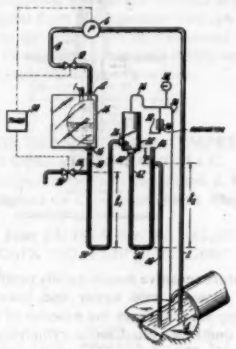
3,940,993

PROPORTIONAL FLUID SAMPLING DEVICE

Heine Lapidot, Latham, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Dec. 19, 1974, Ser. No. 534,377
Int. Cl.² G01N 1/14
U.S. Cl. 73—421 B **4 Claims**

1. An apparatus for obtaining from a flowing stream of fluid material, a sample of said fluid material having a volume that is proportional to the flow rate, said apparatus comprising:
a. intake means for withdrawing fluid material from a stream of fluid material and passing said fluid to a sampling reservoir;
b. a sampling reservoir comprising a chamber;
c. an upper conduit inlet at the top of said sampling reservoir and a lower conduit outlet at the bottom of said sampling reservoir;
d. a drain conduit connected to the said lower conduit outlet of said sampling reservoir, said conduit being extended in a first downward direction and in a second upward direction to form a first hydraulic seal means said lower conduit having outlet means for withdrawal of fluid from said sampling reservoir;
e. an equalizer chamber in open communication with said first hydraulic seal means at the same level as said conduit outlet;
f. a gas bubbling system in open communication with a conduit means at the top of said equalizer chamber and bubbling gas at the open end of another conduit that is submerged in said stream for measuring the variation in the depth in said stream; and
g. an outlet means at the bottom of said equalizer chamber below the level at which said first hydraulic seal means is in open communication with said equalizer chamber, said outlet means being connected to an equalizer chamber drain that extends in a first downward direction and in a second upward direction to form a second hydraulic seal means that is connected to a discharge line.

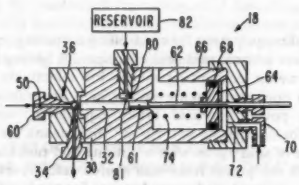


3,940,994

HIGH PRESSURE SAMPLE INJECTION APPARATUS AND METHOD

Richard E. Klee, Napa, and Joseph A. Varozza, III, Saratoga, both of Calif., assignors to Varian Associates, Palo Alto, Calif.

Filed Aug. 1, 1974, Ser. No. 493,593
Int. Cl.² G01N 1/10
U.S. Cl. 73—422 GC **13 Claims**



1. An injector for a liquid chromatograph for injecting a sample liquid into a high-pressure stream of carrier liquid, said injector comprising:
a. structure defining a reservoir for the sample liquid,
b. structure defining a dispensing chamber for receiving a measured volume of the sample liquid from said reservoir,

c. structure defining a flow path for the high-pressure stream of carrier liquid,

d. control structure means interposed between said dispensing chamber and said flow path for substantially preventing liquid flow from said flow path to said dispensing chamber, and for enabling liquid flow from said dispensing chamber to said flow path only when the pressure of said measured volume of sample liquid in said dispensing chamber is at least equal to the pressure of said high pressure stream of carrier liquid, and

e. displacement means for limiting the volume of sample liquid receivable in said dispensing chamber and for imparting to the sample liquid in said dispensing chamber a pressure at least equal to the pressure of said high-pressure stream of carrier liquid.

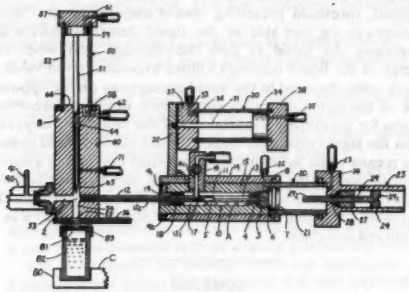
3,940,995
AUTOMATIC FLUID INJECTOR

Rano J. Harris, Sr., 1945 Carolyn Sue Drive, and Rano J. Harris, Jr., 4423 S. Park Drive, both of Baton Rouge, La. 70815

Continuation-in-part of Ser. No. 365,552, May 31, 1973, which is a continuation-in-part of Ser. No. 223,663, Feb. 4, 1972, Pat. No. 3,754,443. This application Sept. 9, 1974, Ser. No. 504,134

Int. Cl.² G01N *1/14*

U.S. Cl. 73—422 GC **11 Claims**



1. In apparatus for repetitively accurately measuring and injecting preselected quantities of fluid specimens into a media such as an inlet to an analytical instrument, the combination comprising

a housing, which can be mounted adjacent an inlet leading into the analytical instrument,

a tubular member mounted within the housing, said tubular member including a pair of communicated openings therethrough, a first axial opening of the pair extending through the tubular member and housing, and a second opening adjacent to and communicated with said first axial opening which can be aligned upon the inlet leading into the analytical instrument,

a needle syringe mounted upon the piston of a piston reciprocating unit, the needle of which is aligned upon said second opening through the tubular member within and through which the needle can be reciprocated by movement of the piston, said syringe including a barrel within which is mounted a plunger, said plunger constituting an integral portion of the piston reciprocating unit by virtue of which said plunger can be reciprocated within the chamber of said barrel,

an injector feed assembly including a hollow probe provided with communicating upper and lower openings mounted on the piston of a piston reciprocating unit, said probe being aligned upon the said first axial opening through the tubular member within and through which the probe can be reciprocated by movement of the piston, and extended through the said first axial opening,

means for transporting a fluid specimen contained in a vial, with a resilient, puncturable closure, below the said first axial opening and into the path of the hollow probe for penetration of said closure by the probe,

means for pressurizing the fluid contents of the vial so that the fluid specimen contained within the vial can be transferred via the lower and upper side openings of the probe into the opening of the needle and into the barrel of the syringe,

the improvement comprising

a valved side inlet located within the barrel of the syringe forward of the point reached by the forward face of the plunger on movement to its maximum forward position within the syringe barrel, the valved side inlet providing, when the valve is in open position, a channel for flow of fluid from the dispensing end of the needle through the forward portion of the barrel, and rearward movement of the plunger to fill the barrel with a fluid specimen in predetermined quantity, and on subsequent forward thrust of the needle of the syringe into the inlet of the analytical instrument, with the valve in closed position the fluid specimen can be readily injected through the dispensing end of the needle by forward movement of the plunger.

3,940,996
METHOD AND DEVICE FOR REMOTELY MONITORING ELECTRICALLY CONDUCTIVE LIQUIDS

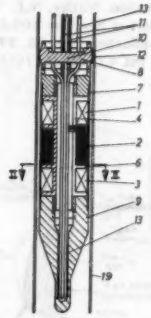
Theodor Lauhoff, Bensberg-Herkenrath; Manfred Quante, Bensberg-Immekeppel; Kurt Erwin Stickel, Cologne; Egon Bolz, Heiligenhaus, and Klaus Semma, Porzurbach, all of Germany, assignors to Interatom, Internationale Atomreaktorbau GmbH, Benzberg, Cologne, Germany

Continuation of Ser. No. 246,532, April 24, 1972, abandoned. This application Nov. 19, 1973, Ser. No. 417,379

Claims priority, application Germany, Apr. 27, 1971, 2120523

Int. Cl.² G01R *33/00*

U.S. Cl. 73—432 R **7 Claims**



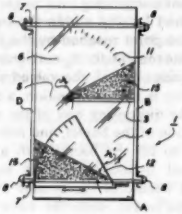
1. Device for carrying out a method of remotely monitoring electrically conductive liquid comprising an interchangeable measuring head, a manipulating tube wherein measuring leads are received, said measuring head being secured to said manipulating tube, a guide tube wherein said manipulating tube is slideably guidable to a given measuring location, at least three induction coils formed of metal-clad insulated wires wound on a common hollow core of pure iron that is provided with a longitudinal slot being received in said measuring head, and said core being formed with peripheral ribs at the ends thereof and between said coils, said peripheral ribs being interrupted by said slot.

3,940,997

APPARATUS AND METHOD FOR MEASURING ANGLE OF REPOSE

Frederick W. Hudson, West Henrietta, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 27, 1973, Ser. No. 428,928
Int. Cl.² G01B 5/24; G01N 11/00, 19/02
U.S. Cl. 73—432 R 20 Claims



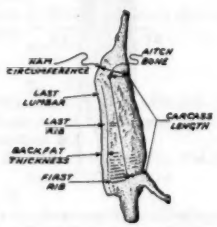
1. An apparatus for measuring the angle of repose of granular material comprising a right-angle parallelepiped body, at least one side of said body being visually transparent, said body divided into two cells by an open ended interior partition sealed on three sides of said body, said open end providing a passageway between said cells for the passage of granular material from one cell to the other, said partition situated in a plane normal to said body, a measuring means on said transparent side to measure said angle of repose of said granular material and at least one cover on one end of said body.

3,940,998

HOG PROCESSING METHOD

John C. Sourby, Mount Kisco, N.Y., and Charles H. Wallace, Carrollton, Va., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Continuation-in-part of Ser. No. 509,374, Sept. 26, 1974, abandoned. This application Oct. 16, 1974, Ser. No. 515,381
Int. Cl.² G01G 19/40
U.S. Cl. 73—432 R 13 Claims



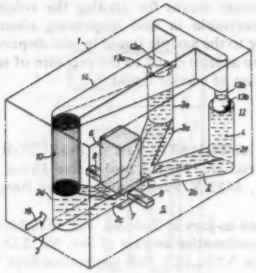
1. A method of hog carcass measurements for determining ham and loin cuts during processing, comprising the steps of:
weighing the carcass;
measuring the ham circumference and carcass length;
measuring the backfat thickness;
indicating the muscle quantity; and
utilizing the measurements to indicate the cutting point in relation to the aitch bone.

3,940,999

SHOCK SENSOR

Kohei Nonaka, Tokyo; Masayoshi Fukushima, and Kunio Sakai, both of Sakai, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Apr. 7, 1975, Ser. No. 565,968
Claims priority, application Japan, Apr. 8, 1974, 49-39706
Int. Cl.² G01P 15/08
U.S. Cl. 73—516 LM 14 Claims



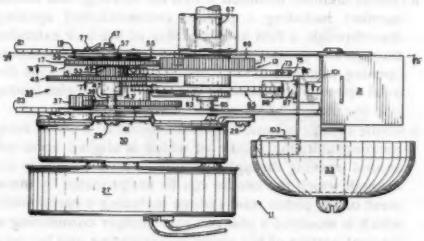
1. A shock sensor comprising a liquid passageway formed in a vessel and containing a body of liquid, signal detection means responsive to the velocity of liquid flow for providing a signal, threshold presetting means disposed in the liquid passageway on one side of the signal detection means for permitting the liquid to pass therethrough only when the energy of the liquid tending to move exceeds a given value, a check valve disposed in the liquid passageway on the opposite side of the signal detection means from threshold presetting means for permitting a movement of the liquid in a direction from the signal detection means toward the threshold presetting means while substantially completely preventing a movement thereof in the opposite direction, and a return path for allowing that portion of the liquid which has moved past the threshold presetting means to pass through the check valve in a forward direction.

3,941,000

EXPANDED SCALE TIMER AND METHOD OF OPERATING SUCH

Ralph H. Allison, Jr., Morrison, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Filed Jan. 30, 1975, Ser. No. 545,338
Int. Cl.² G04F 3/02; F16H 5/80
U.S. Cl. 74—3.5 31 Claims



1. An expanded scale timer comprising means adapted to be driven for indicating the operating time of the timer, a pair of means conjointly and relatively movable for respectively driving the indicating means at different predetermined speeds, and means for effecting actuation of the driving means conjointly to drive the indicating means through one of the driving

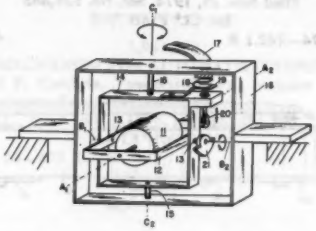
means at one of the speeds and for effecting actuation of the other of the driving means relative to the one driving means to also drive the indicating means at another speed with the one driving means being overridden by the indicating means.

3,941,001

GIMBAL CONTROL MECHANISM

Eugene A. LaSarge, Grandville, Mich., assignor to Lear Siegler, Inc., Grand Rapids, Mich.

Filed Nov. 9, 1973, Ser. No. 414,260
Int. Cl.² G01C 19/04
U.S. Cl. 74—5.2 10 Claims



1. A gimbal control mechanism for a gyroscopic system having a horizontal spin axis for indicating deviations in asimuth or yaw

said gyroscopic system comprising in combination

a rotor mounted in an inner gimbal for rotation about the spin axis,

an outer gimbal containing said inner gimbal mounted therein for rotation about the minor axis, and

a frame member containing said outer gimbal mounted therein for rotation about the major axis,

the said minor axis being substantially at right angles to both the spin and major axes with the said major axis substantially at right angles to the spin axis; and

said gimbal control mechanism comprising in combination

a cam means mounted in fixed angular relationship with the said inner gimbal for rotation about the minor axis,

a cam follower means having a roller end and a protruding stem end mounted in the said outer gimbal for reciprocal movement parallel to the major axis and situated to engage the cam means by the said roller end, and

a bearing surface mounted within the said frame member and aligned for abutment by the protruding stem end of the said cam follower means throughout the rotation of the said outer gimbal about the major axis,

whereby the interaction of the said cam means, said follower means and said bearing surface generates a force to oppose rotor tumbling and gimbal lock, with the intensity of the generated force varying sinusoidally as determined by the contour of the said cam means from a minimum when the spin axis and major axis are perpendicular to each other and to a maximum when the said axes coincide.

3,941,002

POWERED TOOL BENCH

Joseph M. Tucker, Jr., 409 S. Walnut, Bunkie, La. 71322

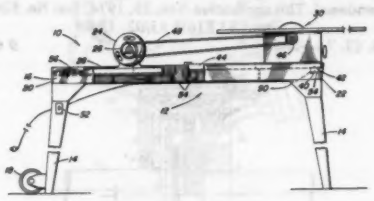
Filed July 22, 1974, Ser. No. 490,412
Int. Cl.² F16M 11/00
U.S. Cl. 74—16 8 Claims

1. A power bench for operating a variety of power and manual shop tools comprising:

a. a bench means having a first and a second end;

b. a motor means mounted on said bench means;

c. means for positioning a tool on said bench means, said means comprising slot means positioned on said bench means to slideably receive tab means positioned on a first end of said tool and restraining means positioned on said bench means to maintain a second end of said power tool in a desired position said restraining means comprising an



electromagnet means positioned on said bench means to magnetically engage a metal plate means positioned on said second end of said power tool; and

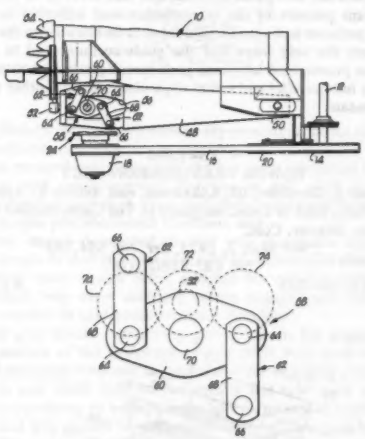
d. means for transmitting torque from said motor means to said power tool.

3,941,003

BALANCED SICKLE DRIVE

Harold Keith Garrison; Cecil L. Case, both of Newton, and Allen A. White, Peabody, all of Kans., assignors to Hesston Corporation, Hesston, Kans.

Filed July 9, 1974, Ser. No. 486,775
Int. Cl.² F16H 21/22
U.S. Cl. 74—44 19 Claims



1. In apparatus for translating rotary motion into reciprocal motion:

a rotary drive shaft;

a single component eccentrically coupled with said shaft for orbital movement about the axis of the shaft when the latter is rotated,

said component being pivotal about a second axis during said orbiting movement;

a reciprocable member; and

structure coupling said member with said component,

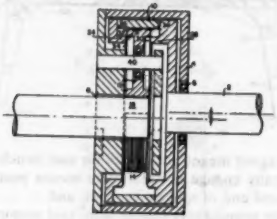
said structure being pivotally connected to said component at a pair of spaced points on opposite sides of said second axis for reciprocating the member during rotation of said shaft.

3,941,004

TRACTION ROLLER TRANSMISSION

Charles Edward Kraus, 3602 Mount Bonnell Road, Austin, Tex. 78731

Continuation-in-part of Ser. No. 366,068, June 1, 1973, abandoned. This application Nov. 25, 1974, Ser. No. 526,831
Int. Cl.² F16H *13/02, 13/06*
U.S. Cl. 74—206 9 Claims



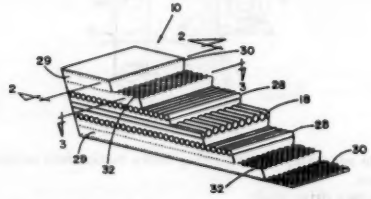
1. In a transmission comprising at least two rotatable means having annular traction surfaces disposed in frictional engagement with each other, one of said rotatable means having annular side faces formed at its opposite ends; guide means provided with guide surfaces arranged adjacent said one, and in radial alignment with the other of said rotatable means, said guide surfaces being radially spaced from the traction surface of said other rotatable means such that, during operation of the transmission, said side faces are in motion relative to said guide surfaces, said guide surfaces and said side faces being arranged in closely spaced parallel planes thereby providing gaps between said guide surfaces and side faces so as to cause lubricant present in the transmission and adhering to said guide surfaces and annular side faces to be drawn into the gaps between the side faces and the guide surfaces and to form therein pressurized lubricant pads steering said one rotatable means into parallel and radial alignment with said other rotatable means.

3,941,005

POWER TRANSMISSION BELT

William J. Gardiner, III, Lakewood, and Arthur L. Aymami, Aurora, both of Colo., assignors to The Gates Rubber Company, Denver, Colo.

Filed Mar. 3, 1975, Ser. No. 554,793
Int. Cl.² F16G *5/16*
U.S. Cl. 74—233 4 Claims



1. A V-belt comprising:

an endless tensile member;

at least two layers of which the first and second layers principally composed of elastomeric material and having substantially the same thickness, the first layer disposed inwardly and the second layer disposed outwardly of the tensile member;

means for transversely supporting the tensile member, the transverse support means disposed in the first and second layers substantially equidistant inwardly and outwardly from the tensile member;

a first ply of bias fabric disposed substantially at the outer peripheral surfaces of the first and second layers, the first ply disposed substantially equidistant from the tensile member and having an angle A between weft and warp threads between 95° and 160°; and

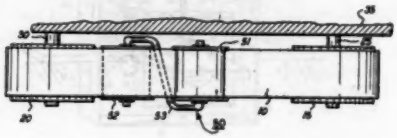
a second ply of bias fabric disposed substantially equidistant from the first ply of bias fabric in each of the first and second layers.

3,941,006

FREE FLOATING BELT TENSIONER

Gerd R. Brodesser, Plano, Tex., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 25, 1974, Ser. No. 526,885
Int. Cl.² F16H *7/12*
U.S. Cl. 74—242.1 R 4 Claims



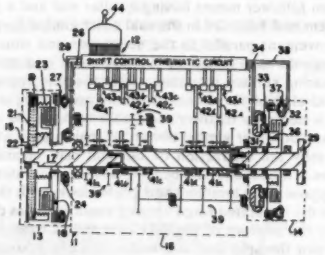
1. In combination with a pulley-driven belt, a belt tensioner for applying a desired tension to said belt; said belt tensioner comprising a pair of rollers and a Z-shaped member for connecting said rollers, each of said rollers being mounted for rotation on one of the parallel arms of said Z-shaped member.

3,941,007

CONTROL SYSTEM FOR SHIFTING A DRIVE TRANSMISSION

Philip S. Webber, Morton, and Maurice F. Franz, East Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 18, 1974, Ser. No. 452,116
Int. Cl.² F16D *67/00*; G01K *1/00*
U.S. Cl. 74—340 12 Claims



1. A control system for a transmission which has an input clutch and an output clutch and a plurality of change speed gears to provide for a plurality of drive ratios therebetween, comprising:

a movable drive ratio selector member having a plurality of positions each corresponding to a separate one of said drive ratios,

a plurality of fluid pressure operated actuators each being shiftable between at least two predetermined positions to couple and decouple predetermined ones of said change speed gears,

shift initiating means for disengaging said input and output clutches in response to movement of said selector member to a newly selected one of said positions thereof,

actuator control means for shifting predetermined ones of said actuators between said positions thereof following said disengagement of said input and output clutches,

sensing means for producing a first signal when each of said plurality of actuators is at one of said predetermined positions thereof,

shift concluding means for re-engaging said input and output clutches following operation of said actuator control means, and

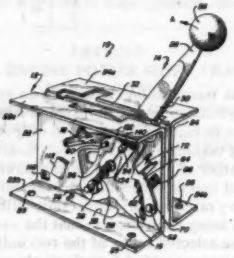
means connected between said sensing means and said shift concluding means for blocking operation of said shift concluding means to block re-engagement of both said input clutch and said output clutch in the absence of said first signal.

3,941,008

SHIFT MECHANISM FOR AUTOMATIC TRANSMISSION

Emanuel F. Cambria, Tannersville, Pa., assignor to Hurst Performance, Inc., Warminster, Pa.

Filed July 1, 1974, Ser. No. 484,708
Int. Cl.² G05G 9/06
U.S. Cl. 74—473 R 15 Claims



1. An in-line shaft mechanism for a vehicle automatic transmission having at least three forward drive positions, comprising:

a support bracket;

a shift lever pivotally mounted on said support bracket;

a shifter plate pivotally mounted on the support bracket, with a motion transmitting connection means to said transmission; and

stop means associated with said shift lever to permit successive pivoting of said shift lever in progressive increments between at least some adjacent shift lever positions only after momentary release of said shift lever after each shifting movement.

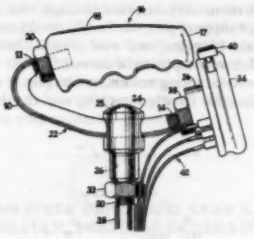
3,941,009

SHIFT LEVER HANDLE

George Seward Brown, 120 S. Main St., West Bridgewater, Mass. 02324

Filed July 18, 1974, Ser. No. 489,831
Int. Cl.² B60K 20/00
U.S. Cl. 74—473 R 2 Claims

1. A shift lever handle comprising, in combination, a connector member for mounting to the top of a vertical gear shift lever and a generally U-shaped member, the legs thereof extending generally horizontally and lying substantially in the same vertical plane, the lower leg having a central portion secured to said connector member, the free end of said lower leg extending beyond said connector to define a mount for a range selector, said mount positioning said selector adjacent the end of the upper leg, said upper leg defining an elongated handle grip such that when the hand of an operator engages



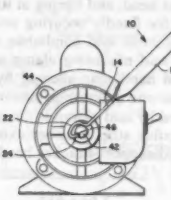
said handle grip in operative fashion, the selector is simultaneously operable by thumb movement of the same hand.

3,941,010

SAFETY RELEASE HANDLE APPARATUS

LeRoy H. Howell, Filer, Idaho, assignor to Stratford Squire International, Magic Mill, Salt Lake City, Utah

Filed Sept. 16, 1974, Ser. No. 506,316
Int. Cl.² G05G 1/12
U.S. Cl. 74—545 15 Claims



1. Handle apparatus for manually rotating a motor shaft in a predetermined direction comprising:

grip means for engaging said shaft to apply rotational torque in said predetermined direction to said shaft and for releasing said shaft when said shaft rotates independently in said predetermined direction, and

lever means connected to said grip means for applying torque to said grip means in said predetermined direction, said lever means being adapted for rotation with said shaft only when said grip means engages said shaft for rotation in said predetermined direction,

said grip means comprising curved means for engaging a portion of the periphery of said shaft, and hook means associated with said curved means for engaging a keyway in said shaft, said curved means and said hook means cooperating to engage said shaft as torque is applied to said grip means in said predetermined direction and to disengage said shaft as said shaft independently rotates in said predetermined direction.

3,941,011

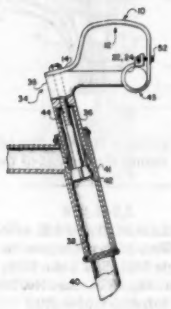
HANDLEBAR SHOCK ABSORBER

Norbert A. Kirk, 43 E. Ohio St., Chicago, Ill. 60611

Filed Sept. 10, 1974, Ser. No. 504,707
Int. Cl.² B61K 21/14
U.S. Cl. 74—551.2 6 Claims

1. A bicycle handlebar shock absorber for use with a support bracket for the handlebar of a bicycle, said support bracket comprising a head, a hollow support post extending downward from said head for attaching said support bracket to said bicycle, a support stem extending outward from said head, said support stem further comprising a mounting clamp extending from the free end thereof for receiving the handle-

bar of said bicycle in a manner which allows rotational and lateral, but substantially no radial movement of said handlebar, within said clamp, and said support bracket further comprising a bolt removably inserted through said head into the interior of said support post for fixedly attaching said support bracket to said bicycles, and said shock absorber for said bicycle handlebar comprising a curved flexible strip member producing torsional spring action, and having at one end a first mounting means for fixedly attaching said flexible strip member to said bracket head, and having at its other end a second mounting means for fixedly securing said other end of said flexible strip member to said handlebar at positions adjacent to either side of said mounting clamp such that the lateral movement of said handlebar allowed by said clamp is prevented by said second mounting means and the rotational movement allowed by said clamp is dampened by said spring action of said flexible strip member extending between said handlebar and said support bracket head.

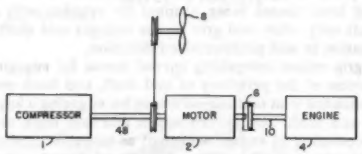


3,941,012

DUAL DRIVE MECHANISM

Donald K. Mayer, Bloomington, Minn., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 441,685, Feb. 11, 1974, abandoned.
This application May 7, 1975, Ser. No. 575,289
Int. Cl.² F16H *37/06*; F25B *27/00*; F16D *43/06*; F02B *73/00*
U.S. Cl. 74—661 5 Claims



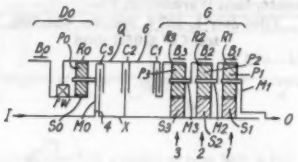
1. A dual drive mechanism for selectively driving a driven member either by a first electric motor prime mover or alternatively by a second prime mover wherein said first prime mover is disposed between said driven member and second prime mover, said first prime mover having a housing consisting of a stator frame connected to a portion of the frame of the second prime mover and a portion of the frame of the driven member, an output shaft for said second prime mover protruding into said housing, an electric motor rotor assembly having means adapted to be driven by a speed responsive clutch, said rotor assembly journalled for rotation on said protruding portion of said second prime mover output shaft, said speed responsive clutch connected to said second prime mover output shaft and adapted to drive said rotor assembly when the rotational speed of said output shaft exceeds a predetermined minimum, and means to connect said rotor assembly to said driven member to cause said driven member to rotate when said rotor assembly is rotated either in response to the energization of said first electric motor prime mover or in response to the rotation of said second prime mover output shaft above the predetermined minimum speed.

3,941,013

COMPOUND EPICYCLIC TRANSMISSION SYSTEMS

Albert Arthur Miller, Esher, England, assignor to Wilson Miller & Co., Ltd., Middlesex, England

Filed Aug. 14, 1974, Ser. No. 497,220
Claims priority, application United Kingdom, Aug. 17, 1973, 38957/73
Int. Cl.² F16H *37/00*
U.S. Cl. 74—740 15 Claims



1. A vehicle transmission comprising an epicyclic change-speed gear unit constructed to provide at least two reduction ratios between its input member and its output member by the application of braking means selectively to arrest the rotation of one or another of its reaction members, and a supplementary two-speed unit constructed to provide selectively a direct drive or unitary ratio and an indirect ratio differing from unity, the two units being connected so that the overall ratio is the product of the selected ratios of the two units, wherein connecting means are provided for selectively establishing (1) a first driving connection to one of the said reaction members of the change-speed unit from the output member of the supplementary two-speed unit operating in its indirect ratio and (2) a second driving connection between the input member of the change-speed gear unit and the input member of the supplementary two-speed unit.

3,941,014

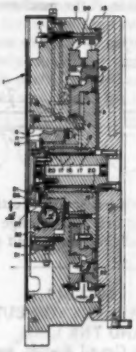
PRECISION HEAVY DUTY INDEXER

Milton L. Benjamin, Chagrin Falls, and David D. Walker, Solon, both of Ohio, assignors to Erickson Tool Company, Solon, Ohio

Filed Jan. 20, 1975, Ser. No. 542,106
Int. Cl.² B23B *29/32*
U.S. Cl. 74—826 25 Claims

1. An indexer comprising a fixed housing having a bore therethrough; an indexing member having a spindle portion journaled in said bore for rotary indexing movement about the axis of said bore; said housing and indexing member having annular rows of axially interfitting radial teeth which respectively have tapered convexly and concavely curved sides which when interengaged rigidly retain the indexing member in any of its indexed positions coaxially of said bore and against circumferential and radial play; actuating means in said housing for axially moving said indexing member in one direction to disengage said teeth thus to release said indexing member for indexing movement, and in the opposite direction to engage said teeth to lock said indexing member as aforesaid; drive means in said housing for imparting rotary indexing movement to said indexing member when said teeth are disengaged; said drive means including a rotary drive member coaxially around said bore; said drive member and said spindle

portion having other axially interfitting tapered teeth which are interengaged when said indexing member is moved in such



one direction and which yet interfit with clearance when said indexing member is moved in such opposite direction.

3,941,015

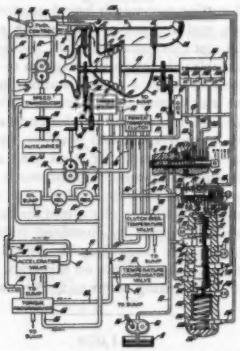
GAS TURBINE ENGINE POWER SHIFT TRANSMISSION POWER TRAIN

Donovan L. Robinson, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 273,728, July 21, 1972, Pat. No. 3,851,463. This application Aug. 5, 1974, Ser. No. 495,089

Int. Cl.² B60K *41/10*

U.S. Cl. 74—856 **7 Claims**



1. In a power train; comprising in combination; a power shift transmission having input means, load output means and a plurality of fluid operated drive establishing friction devices having engagement slip characteristics related to the torque being transmitted for establishing a plurality of ratio drives between said input means and output means during normal drive when the input means drives and transmits normal drive torque to the output means and during overrun drive when the output means drives and transmits overrun drive torque to the input means; torque signal means operatively connected to said transmission providing a signal varying in response to increasing normal drive torque and increasing overrun drive torque; a source of fluid pressure; regulator valve means connected to said source and signal means providing a regulated normal drive pressure and a regulated overrun drive pressure increasing respectively as a function of increasing normal drive torque and increasing overrun drive torque and shift control means operatively connected to said regulator valve and transmission selectively connecting said regulated normal drive pressure during normal drive and said regulated overrun drive pressure during overrun drive to said drive establishing friction devices to provide engagement slip characteristics proportional to said regulated pressures.

3,941,016

LOAD AND SPEED DEPENDENT GEAR CHANGE HYDRAULIC PRESSURE GENERATOR

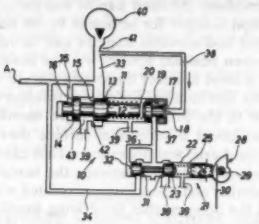
Gerhard Will, Beutelsbach, Germany, assignor to Robert Bosch G.m.b.H., Gerlingen-Schillerhohe, Germany

Filed Apr. 29, 1974, Ser. No. 464,809

Claims priority, application Germany, May 5, 1973, 2322818

Int. Cl.² B60K *41/04*

U.S. Cl. 74—867 **3 Claims**



1. Apparatus supplying a gear changing or switching pressure, for use in vehicle transmissions, comprising:

a pump (**40**) driven by the engine of the vehicle with a speed representative of engine speed, and a switching pressure line (**33**) connected to the pump and having arising therein a fluid switching pressure proportional to engine speed;

a pressure controller (**10**) having a main valve slider (**12**), and feedback means (**35, 14, 16**) connected thereto and controlling the switching pressure;

displaceable means (**21, 28, 23, 37**) changing position as a function of the change of position of the controller for the engine which controls engine speed and providing a force acting on the main valve slider (**12**) of the pressure controller, representative of engine controller position,

the improvement comprising:

a Venturi (**41**) located in the switching pressure line; and

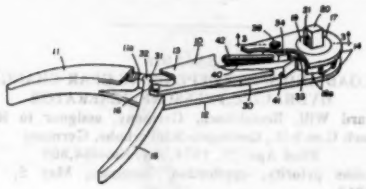
a control pressure line (**38**) branched off the throat of the Venturi to provide a pressure signal representative of flow of pressure fluid at the control pressure through the constriction;

said control pressure line (**38**) and the displaceable means (**21, 28, 23, 24, 37**) providing a force representative of engine controller position acting on the main valve slider (**12**) such that the force representative of the control pressure and the force representative of engine controller position are applied to the main valve slider (**12**) in additive relation to change the position of the main valve slider as a function of the sum of said forces.

3,941,017
PLIER TYPE RATCHET WRENCH

Paul E. Lenker, and Raymond G. Voss, both of Davenport, Iowa, assignors to Davenport Tool Co., Eldridge, Iowa

Continuation-in-part of Ser. No. 567,750, April 14, 1975, abandoned. This application June 19, 1975, Ser. No. 588,190
Int. Cl.[2] B25B *13/46*
U.S. Cl. 81—57.39 8 Claims



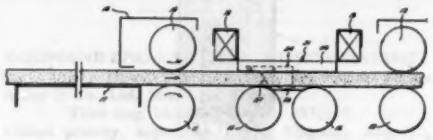
1. In a tool of the type described including an elongated first member having opposite first and second end portions, the first end portion constituting a fixed handle; a second elongated member constituting a movable handle and pivoted adjacent one end to the first member about a first axis disposed intermediate the fixed handle and the second end portion of the first member for actuation by the hand of a user so that the fixed and movable handles can be squeezed from a maximum open position toward a close position relative to each other; a drive member disposed adjacent the second end portion of the first member for driving rotation about a second axis parallel to the first axis, the drive member including a drive ratchet about a peripheral surface thereof concentric with the second axis; and operating means carried by the first member disposed generally between the movable handle and the drive member and operatively associated with the movable handle and the drive ratchet for driving rotation of the drive member upon said actuation of the handles, the improvement wherein the operating means comprises: an elongated rigid thrust bar having opposite first and second ends disposed between the movable handle and the drive ratchet, the first end of the thrust bar being pivotally connected to the movable handle about a third axis parallel to the first axis, the second end of the thrust bar constituting a drive nose engaging the drive ratchet so that the thrust bar imports driving rotation in one direction to the drive member upon said actuation of the handles; a pawl pivoted to the first member about a fourth axis parallel to the first axis, the pawl being laterally spaced from the second end of the thrust bar and engaging the drive ratchet effective to prevent rotation thereof in the opposite direction; and a single extensible helical spring disposed in tension between the thrust bar and the pawl effective through the thrust bar to hold the movable handle in said open position and to hold each of the thrust bar drive nose and the pawl in engagement with the drive ratchet, squeezing of the handles toward their close position extending the spring against its tension.

3,941,018
BOARD CUTTING MACHINE

Jimmy L. Williams, Houston, Tex., assignor to Glass Master Corporation, San Antonio, Tex.

Filed Dec. 23, 1974, Ser. No. 535,176
Int. Cl.[2] B26D *3/06*; B27F *5/02*
U.S. Cl. 83—5 6 Claims

1. An insulating board cutting machine comprising,
means for driving a board through the machine,
spaced board guide means guiding a board to be cut along a plane touching each guide means,
blade support means on the side of said plane opposite the board guide means,
and blade means carried by said blade support means,
said blade means having a first cutting edge extending from the blade support means past said plane and into the space between said board guide means,
said first cutting edge extending at an acute angle to said plane on the feed side of the machine,

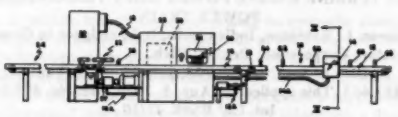


said blade means having a second cutting edge extending from the end of said first cutting edge in a plane substantially parallel to said first mentioned plane.

3,941,019
METHOD AND APPARATUS FOR CUTTING LUMBER AND THE LIKE

Ralph B. Baldwin, East Grand Rapids, and James T. Visser, Grand Rapids, both of Mich., assignors to Oliver Machinery Company, Grand Rapids, Mich.

Filed May 9, 1973, Ser. No. 358,814
Int. Cl.[2] B26D *5/02*
U.S. Cl. 83—71 22 Claims



1. A computer-controlled stock-cutting system comprising in combination: an electronic computer means for producing optimum-yield cutting commands based on stock defect location information and at least one dimension of different required pieces; a stock examining station, including means for supplying stock defect location information to said computer upon examination of stock; a cutting station, including means for cutting the stock; and drive means controlled by said computer means and having portions for contacting said stock and controlling its movement and position, by moving while contacting the stock to transport stock past said means for cutting, by stopping to thereby stop the stock relative to the cutting means at positions determined by said computer means where cutting is to take place, and for holding the stock securely where so stopped by sustained stationary contact therewith, whereby the stock may be automatically moved and positioned, and cut, at places on the stock whose position is established by said cutting commands from said computer.

3,941,020
APPARATUS FOR CUTTING WORKPIECES SUCH AS COMPONENTS FOR MITERED CORNER PICTURE FRAMES WITH MINIMUM WASTE

James R. Huntley, and William Franklin Southard, both of Monroe, N.C., assignors to James R. Huntley, Monroe, N.C.

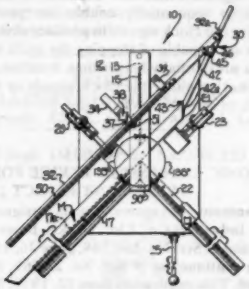
Filed Feb. 27, 1975, Ser. No. 553,839
Int. Cl.[2] B26D *7/16*, *1/14*
U.S. Cl. 83—468 13 Claims

1. An apparatus for easily and quickly cutting with minimum waste workpieces, such as components for making mitered corner picture frames, from an elongate strip of material of any predetermined width, in which each workpiece has opposing ends which are equally and oppositely angled with respect to each other and an inside edge of predetermined length; said apparatus comprising:

guide means for positioning the elongate strip of material at desired positions along a longitudinally extending axis;

saw means cooperating with said guide means for making spaced, successive, angular, parallel cuts through the elongate strip to form workpieces with parallel angular cut ends and for thereafter cutting off and removing a wastepiece from one end of each cut workpiece by making an oppositely angled cut; and

means operatively positioned and associated with said guide means and said saw means for (1) providing a stop for



properly positioning the strip of material regardless of the width thereof before each cut for making the next workpiece, and (2) measuring the ultimate desired inside edge length of each workpiece to be cut from the strip of material while compensatively adding the necessary additional inside edge length to the workpiece being cut to provide an initially cut workpiece of the proper combined inside edge length for the subsequent cutting off of only a minimum waste, triangular shaped, wastepiece which removes the additional inside edge length.

3,941,021

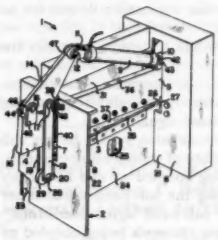
SHEARING APPARATUS

John W. Meinholdt, 1900 N. Central, Topeka, Kans. 66608

Filed Jan. 17, 1975, Ser. No. 541,859

Int. Cl.² B26D 5/18

U.S. Cl. 83—604 **6 Claims**



1. A shearing apparatus comprising:

a. an elongated frame having opposite ends and a bed plate having a shear edge extending along a major portion of the distance between the opposite ends of said frame;

b. said bed plate of said frame has a substantially horizontal upper surface;

c. an elongated shearing member having opposite ends, one end of said shearing member being pivotally mounted on said frame adjacent one end of said frame;

d. said shearing member has an upper edge and a lower edge;

e. the pivotal mounting of the one end of said shearing member on said frame comprises a pin having a longitudinal axis positioned below the upper surface of said bed plate;

f. an extensible member having one end thereof pivotally supported adjacent said one end of said frame;

g. a crank arm having a fulcrum pivot and a long arm and a short arm, the other end of said extensible member being pivotally connected to said long crank arm, said short crank arm being pivotally connected to said shearing member adjacent the other end thereof;

h. the other end of said extensible member is pivotally connected to a first pivot point of said crank arm;

i. the other end of said shearing member is pivotally connected to a second pivot point of said crank arm;

j. the long arm of said crank arm is defined by the portion of the crank arm between said fulcrum pivot and said first pivot point;

k. the short arm of said crank arm is defined by the portion of the crank arm between said fulcrum pivot and said second pivot point;

l. said crank arm and said second pivot point thereof being positioned above the upper edge of said shearing member;

m. means on said frame movably supporting said crank fulcrum pivot to accommodate the arcs of the short lever arm and shearing member as the crank arm is actuated by the extensible member;

n. said means movably supporting said crank fulcrum pivot comprises an elongated connecting link having one end thereof pivotally connected to said fulcrum pivot of said crank arm and the other end thereof pivotally connected to the other end of said frame; and

o. guide means mounted on said frame adjacent the other end thereof to guide said shearing member during movement thereof in shearing cooperation with the bed plate shear edge of said frame in response to operation of said extensible member.

3,941,022

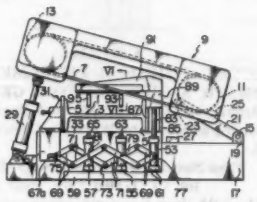
HORIZONTAL BAND SAWING MACHINE SUITED FOR CUTTING STEEL SECTIONS LIKE H-SHAPED STEEL

Masao Sato, and Hideji Majima, both of Sagamihara, Japan, assignors to Amada Company Ltd., Isehara, Japan

Filed Nov. 13, 1974, Ser. No. 523,453

Int. Cl.² B26D 1/46

U.S. Cl. 83—796 **2 Claims**



1. A band sawing machine of the horizontal type comprising a blade housing (9) pivotally connected to a bed (17) by means of a link member (21), means (29) for downwardly moving said blade housing (9) relative to said bed (17) in a cutting stroke through a cutting station (31), said link member (21) being pivotally connected at one end thereof to said bed (17) by means of a first hinge portion (15) disposed remote from said cutting station (31), said link member (21) being pivotally connected at the other end thereof to said blade housing (9) by means of a second hinge portion (23) disposed relatively closer to said cutting station (31) than said first hinge portion (15), first stop means (25) carried by said blade housing (9) and adapted to engage said link member (21) to limit relative rotation between said link member (21) and said blade housing (9) in one direction about said hinge portion (23), and second stop means (27) carried by said bed (17)

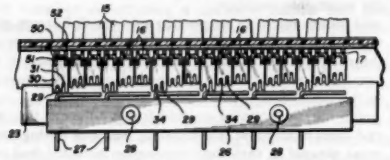
and adapted to engage said link member (21) to limit relative rotation between said link member (21) and said bed (17) in one direction about said hinge portion (15) during downward movement of said blade housing (9) in a cutting stroke, whereby said blade housing (9) will rotate about said first hinge portion (15) during the initial stages of a cutting stroke while said link member (21) remains in engagement with said first stop means (25) thereby preventing relative rotation between said link member (21) and said blade housing (9), and said blade housing (9) will then rotate about said second hinge portion (23) during the completion stage of a cutting stroke as said link member (21) comes into engagement with said second stop means (27) thereby preventing relative rotation between said link member (21) and said bed (17).

3,941,023

CHORD BUTTON ASSEMBLY

Howard M. Thomas, North Tonawanda, and Richard A. Borowiec, Grand Island, both of N.Y., assignors to The Wurlitzer Company, Chicago, Ill.

Filed June 14, 1974, Ser. No. 479,339
Int. Cl.[2] G10H *1/00, 5/00*
U.S. Cl. 84—1.01 10 Claims



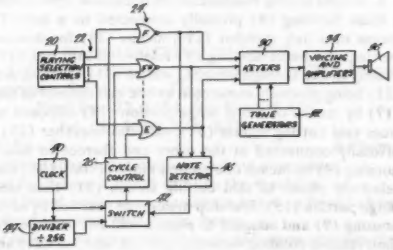
1. A key assembly for use in a musical instrument the keyboard comprising; an elongated mounting strip for attachment to a support structure located within an electronic musical instrument, a plurality of immediately adjacent keys, and a plurality of flexural portions respectively integrally connecting said plurality of keys to said mounting strip for common connection to said support structure, each of said keys having a tab extending downwardly therefrom, each of said tabs having a first recess formed therein to receive a return spring and a second recess formed therein to receive an electric contact element.

3,941,024

ELECTRICAL MUSICAL INSTRUMENT WITH AUTOMATIC SEQUENTIAL TONE GENERATION

John R. Brand, Mt. Prospect, Ill., and David J. Mate, San Diego, Calif., assignors to Warwick Electronics, Inc., Chicago, Ill.

Filed Nov. 20, 1974, Ser. No. 525,465
Int. Cl.[2] G10H *1/00, 5/00*
U.S. Cl. 84—1.01 15 Claims



1. An electrical musical instrument comprising:

selection means for producing tone control signals representing musical tones which are to be produced;

a plurality of gates coupled to the selection means and each being individually enabled to pass a corresponding tone control signal if present when the gate is enabled;

keyer means coupled to the plurality of gates and responsive to the tone control signals passed by the gates for producing corresponding musical tones; and

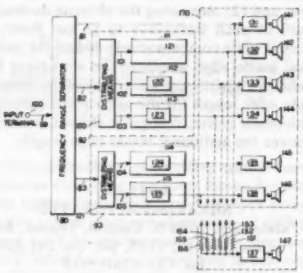
cycle means coupled to the plurality of gates for enabling the gates in sequence, including a clock for producing clock signals which are capable of stepping the cycle means to sequentially enable the gates, a divider for dividing the clock signals to produce divided clock signals which are capable of stepping the cycle means and which have a substantially longer time duration, and logic means for selecting either the clock signals or the divider clock signals to step the cycle means.

3,941,025

ELECTRONIC EXPRESSION DEVICE FOR PRODUCING TREMULANT EFFECT

Kinji Kawamoto, Neyagawa, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 266,348, June 26, 1972, abandoned, which is a continuation of Ser. No. 22,569, March 25, 1970, abandoned. This application June 12, 1973, Ser. No. 369,214
Int. Cl.[2] G10H *1/02*
U.S. Cl. 84—1.25 16 Claims



1. An electronic expression device for producing a novel tremulant effect, comprising:

an input terminal to which an audio frequency signal is applied;

a frequency range separator connected to said input terminal for separating an audio frequency signal into a plurality of sub-band signals;

at least one modulation system having a distributing means and a plurality of transmission channels, said distributing means being coupled to said frequency range separator for receiving the sub-band signal other than the lowest frequency sub-band signal therefrom, said plurality of transmission channels being coupled to said distributing means, and at least one of said transmission channels having a modulation means for modulating an input signal of said transmission channel by a modulation signal having a sub-audio frequency in such a manner that the input signal is modulated with a modulation depth increasing as the frequency of said audio frequency signal increases and exceeding $\pm \pi/2$ radians when the modulation is phase modulation and exceeding 100% when the modulation is amplitude modulation in the high frequency range of said audio frequency signal so as to have a different modulation from the signals of at least one of the other transmission channels; and

a coupling means coupled to said transmission channels for receiving all of the output signals from said transmission channels and coupled to said frequency separator for

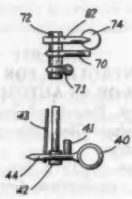
receiving said lowest frequency sub-band signal from said frequency separator, said coupling means coupling all said signals with each other, whereby at least one of the plurality of transmission channels puts out an output signal which has a different modulation from the output signals of at least one of the other transmission channels of said plurality of transmission channels, and said coupling means couples the output signals from said plurality of transmission channels and the lowest frequency sub-band signal together in order to produce final output signals, at least one vector of which fluctuates differently from other vectors in a frequency range other than said lowest frequency sub-band.

3,941,026

CLARINET KEY MECHANISM

Karl H. Hildebrandt, 521 E. 6th St., Apt. 11, Long Beach, Calif. 90802

Filed Sept. 16, 1974, Ser. No. 506,223
Int. Cl.² G10D 7/06
U.S. Cl. 84—382 **7 Claims**



1. On a clarinet, a spring-break clarinet key mechanism comprising:

a first pad for covering a first tonal opening in a clarinet body, said first pad being mounted on a first arm and said first arm being pivotable about a first axis for moving said first pad into and out of closed position with respect to said first tonal opening, a ring key pivotally mounted on said first axis, said first arm and said first axis being free to rotate relative to each other, a spring having one end connected to said ring key and the other end bearing against said first arm to urge said first pad into closed position when said ring key is depressed;

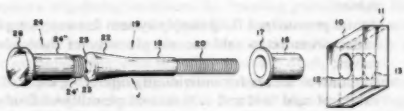
a second pad for moving out of and into closed position over a second tonal opening in the clarinet body, and interengaging means between said second pad and said first pad so that, when said second pad is in the open position, said first pad is urged into the open position against the tension of said spring if said ring key is depressed.

3,941,027

FASTENER SYSTEM FOR STRUCTURAL MEMBERS

Harry S. Gibson, Jr., and Stephen C. Rogers, Jr., both of Atlanta, Ga., assignors to Lockheed Aircraft Corporation, Burbank, Calif.

Filed May 8, 1975, Ser. No. 575,987
Int. Cl.² F16B 5/00
U.S. Cl. 85—1 R **6 Claims**



1. A fastener system adapted to secure abutting, structural members having aligned openings of substantially equal diameter passing therethrough comprising in combination:

a sleeve having an external diameter substantially equal to the diameter of said aligned structural member openings and a length not less than the aggregate length of said aligned openings of said abutting structural members; and

a fastener element and mandrel element integrally connected end to end in coaxial alignment by a neck of substantially less thickness to thereby constitute a frangible connection,

said mandrel element being formed by a constant diameter portion at the end thereof remote from said neck which conforms in diameter and shape to the interior of said sleeve and is at least as long as said aligned openings of said abutting structural members whereby said sleeve is adapted to be disposed on and around said constant diameter portion with substantially no applied force and a tapered diameter portion between said neck and said constant diameter portion with the maximum transverse dimention thereof located adjacent said neck and equal to the interior sleeve diameter plus about 3.5 percent to 6.5 percent of said interior sleeve diameter, and

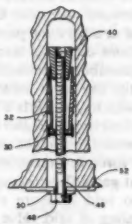
said fastener element being formed by a shank having a length approximately equal to that of said aligned and contiguous structural member openings and a diameter substantially equal to that of said sleeve interior plus about from 2 percent to 5 percent of said sleeve interior diameter, a head on the end of said shank remote from said neck shaped and sized to conform with and abut the opening defining surface in the adjacent structural member and a tail end adjacent said neck including a retainer element adapted to act in opposition to said head.

3,941,028

MINE ROOF EXPANSION ANCHOR

John Lobello, Syracuse, N.Y., and George W. Allen, Hudson, Ohio, assignors to The Eastern Company, Naugatuck, Conn.

Filed Mar. 6, 1975, Ser. No. 555,717
Int. Cl.² F16B 13/06
U.S. Cl. 85—73 **7 Claims**



1. A mine roof anchor assembly comprising:

a. a threaded bolt:

b. a tapered plug having large and small ends and a central, threaded opening extending therethrough, into which said bolt is threaded;

c. a hollow expansion shell having a first open end having an inner transverse dimension larger than the small end and smaller than the large end of said plug, whereby axial movement of said plug into said first open end effects expansion of said shell, and a second open end having an inner transverse dimension larger than the diameter of said bolt and through which said bolt extends; and

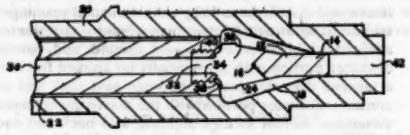
d. a retaining element in generally covering relation to said second open end, said element having a substantially planar portion with a central opening through which said bolt is threaded, and an engagement portion comprising at least two strips formed integrally with and extending from opposite sides of said planar portion, substantially perpendicular thereto, to engage said shell and hold said retaining element in engagement therewith.

3,941,029

PRESSURE RELIEF VALVE FOR PROVIDING RECOIL TO BLANK-FIRING WEAPONS

Fred J. Skahill, Davenport, Iowa, assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 17, 1974, Ser. No. 533,564
Int. Cl.² F41F 17/12
U.S. Cl. 89—14 E 4 Claims



1. In combination with a weapon barrel used for firing blank cartridges, said barrel having a bearing support slidably mounted thereto adjacent its muzzle end, the improvement therewith comprising a pressure relief valve having a nozzle threadedly mounted to the muzzle end of said barrel and interiorly said bearing support, said valve further comprising,

a conically shaped portion foward said nozzle,

a valve tip forward said conically shaped portion, said valve tip having a forward and rearward portion,

a slotted passage disposed within said conically shaped portion of said valve and between said rearward portion of said valve tip and said nozzle and communicating with said nozzle to permit flow of propellant gases from a central orifice in said nozzle to said valve tip,

a gas assist chamber surrounding said slotted passage and said conical portion of said valve, said gas assist chamber having an inner wall comprising said conically shaped portion of said valve and an outer wall comprising a conical surface disposed within said bearing support, said bearing support conical surface being similarly configured as the valve conical surface and spaced therefrom,

an exhaust port forward said valve tip, said gas assist chamber being sealed at a forward portion by said valve tip to prevent gases from escaping through said exhaust port, said gas assist chamber communicating with said muzzle and said valve tip, the cross-sectional area across face of said muzzle at which gas exerts a backward force when a blank round is fired being greater than the cross-sectional area of said rearward portion of said valve tip at which gas exerts a foward force to thus provide recoil to said barrel when propellant gases flow through said barrel bore and nozzle and into said pressure relief valve, said recoil providing unsealing of said valve tip from said gas assist chamber and thus allowing propellant gas venting through said exhaust port.

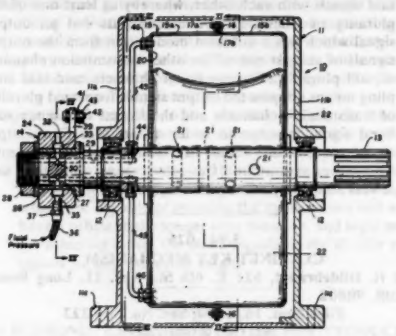
3,941,030

FLUID PRESSURE-GRAVITY MOTOR

Patrick Massung, 620 Eden Park Blvd., McKeesport, Pa. 15132

Filed July 29, 1974, Ser. No. 492,683
Int. Cl.² F01L 33/02; F01B 1/06, 13/06
U.S. Cl. 91—4 R 6 Claims

1. A fluid pressure-gravity activated motor comprising a rotor having a shaft by which the rotor is mounted for rotation about the axis of said shaft and a series of rigid chambers circumferentially arranged about said shaft, a bag of flexible elastomeric material within each of said chambers, means providing communication between the bags in each pair of chambers on diametrically opposite sides of the shaft of said rotor, and a quantity of high density liquid contained in one bag of each pair of said bags, which liquid is shifted therefrom to the other bag of the pair in a diametrically opposite chamber due to compression of the said one bag by fluid under pressure acting directly on said one bag, and rotary valve means by which fluid under pressure is supplied in timed



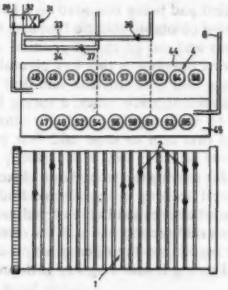
sequence to successive rigid chambers to effect compression of the bag therein.

3,941,031

PNEUMATIC CONTROLLER FOR CONTROLLING THE OPERATION OF AN AUTOMATIC MACHINE

Günter Haddenhorst, Dusseldorf-Gerresheim, Germany, assignor to Gerresheimer Glas Aktiengesellschaft, Duesseldorf-Gerresheim, Germany

Filed Nov. 30, 1973, Ser. No. 420,566
Claims priority, application Germany, Dec. 5, 1972, 2259413
Int. Cl.² F01B 25/02
U.S. Cl. 91—6 4 Claims



1. In an fluid controlled device for controlling a machine which includes a plurality of fluid actuated elements, a valve assembly having a first and a second plurality of fluid control valves, and means individually connecting each of said fluid control valves to one of said fluid actuated elements of said machine to enable actuation thereof through said control valves, the improvement comprising:

a first pressurized fluid supply system for supplying fluid under pressure to said first plurality of fluid control valves;

a second pressurized fluid supply system for supplying fluid under pressure to said second plurality of fluid control valves;

valve control means for individually operating each of said valves of said first and said second plurality of fluid control valves to enable selected actuation of said fluid actuated elements by supply thereto of pressurized fluid through said fluid controlled device;

venting valve means connected within said second pressurized fluid supply system to depressurize said second sys-

tem thereby to prevent pressurized fluid from being supplied to said second plurality of fluid controlled valves normally supplied by said second system while enabling said first supply system to supply pressurized fluid to said first plurality of fluid control valves; said venting valve means including a four-way valve, said second pressurized fluid supply system connected to said four-way valve, means connecting said four-way valve to said second plurality of fluid control valves, vent means connecting said four-way valve to vent the pressure fluid supplied thereto in order to divert said fluid from said second plurality of fluid control valves, said four-way valve operating to switch said pressurized fluid supply between said second vent means and said second plurality of fluid control valves; and

an ancillary fluid supply system coupling said four-way valve with selected ones of said fluid actuated devices normally supplied with actuating fluid through said first plurality of fluid controlled valves to enable actuation of said selected fluid actuated devices directly from said second pressurized fluid supply system through said four-way valve when said four-way valve is switched to vent said pressure fluid supply to prevent said fluid from being supplied to said second plurality of fluid control valves.

3,941,032

PISTON PUMPS OR MOTORS

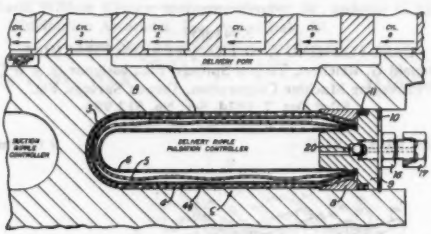
Robert Cecil Clerk, Edison House, Fullerton Road, Queensway Industrial Estate, Glenrothes, Fife, Scotland

Filed June 24, 1974, Ser. No. 482,084

Claims priority, application United Kingdom, June 22, 1973, 29690/73; June 14, 1974, 29690/74

Int. Cl.² F01B *3/00;* **F16L** *55/04*

U.S. Cl. 91—6.5 **5 Claims**



1. In a multi-cylinder, reciprocating position type fluid pressure energy translating device in which there is relative movement between a cylinder block and a fluid handling section which defines internal, spaced, low and high pressure ducts, and in which such relative movement successively brings open ends of the piston chambers in the cylinder block into alternate open communication with the low and the high pressure ducts in the fluid handling section, and in which piston reciprocation and the relative movement between the cylinder block and said fluid handling section is timed so that each piston travels on at least a portion of its compression stroke between the time its chamber breaks communication with said low pressure duct and the time its chamber begins direct communication with said high pressure duct,

pressure regulating structure for leveling pulsations in the high pressure duct including a ripple control capsule disposed in a chamber in communication with and only in communication with the high pressure duct,

said capsule comprising a pair of spaced inner and outer porous wall members and a flexible, impermeable bag-like member disposed between said inner and outer wall members such that movement of said bag-like member is restricted by said inner and outer wall members, means for sealing the space within the bag-like member from the space outside of the bag-like member, and means for introducing fluid under pressure into said bag-like member,

and wherein said capsule is so disposed in communication with the high pressure duct that the pressure in the high pressure duct is in communication with the space outside of said bag-like member such that pulsations in the high pressure duct are reduced.

3,941,033

HYDRAULIC STEERING APPARATUS

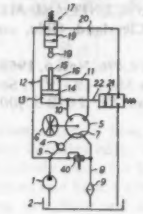
Carl Ivar Olsen, Sonderborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Nov. 15, 1973, Ser. No. 416,179

Claims priority, application Germany, Nov. 22, 1972, 2257230

Int. Cl.² F15B *11/08, 13/04*

U.S. Cl. 91—446 **1 Claim**



1. Hydraulic steering apparatus comprising a sump and a continuously operative pump, an operating motor for controlling the parts to be steered, a steering wheel operated control device having alternately selectable output lines and having a neutral position connecting said pump to said sump through a short-circuiting path and having two operating positions selectively connecting said pump to one side of said operating motor and connecting the other side of said operating motor to said sump, short-circuiting conduit means extending from said pump to said sump, first and second valve means arranged in series in said short-circuiting conduit means, said first and second valve means being mechanically and pressure operated respectively, said first valve means being mechanically operated by said motor upon reaching a predetermined limiting position, and at least one of said output lines being connected to said second valve means for closing said second valve means when said one output line is depressurized.

3,941,034

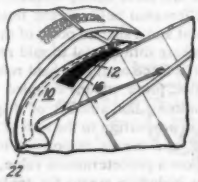
FILTER ATTACHMENT FOR AUTOMOBILE PASSENGER COMPARTMENT AIR INTAKE

Carl Helwig, and Dolores F. Helwig, both of 1358 E. Colorado St., Glendale, Calif. 91205

Filed July 11, 1974, Ser. No. 487,580

Int. Cl.² B60H *3/06*

U.S. Cl. 98—2.11 **6 Claims**



1. The combination of a filter attachment and an automobile, said automobile having a passenger compartment, a hood

and an air intake for said passenger compartment, said air intake being disposed beneath or adjacent to said hood, said attachment being positioned in overlying relationship to said air intake, said attachment having a filter unit, said filter unit comprising two layers of porous flexible non-woven paper, each layer containing thermoplastic material, said layers being heat sealed together to form a plurality of adjacent pockets extending continuously across the major portion of said air intake, each of said pockets containing a plurality of small pieces of activated charcoal, said attachment having a sheet surrounding said filter unit, said sheet closing off all of the portions of said air intake except those beneath said filter unit, whereby all air passing into said passenger compartment through said air intake passes through and is filtered by said filter unit.

3,941,035

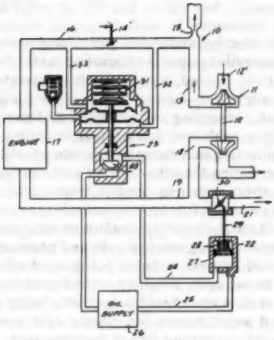
CONTROL UNIT AND METHOD

Milton W. Mueller, Cleveland, Ohio, assignor to TRW Inc., Cleveland, Ohio

Division of Ser. No. 874,496, Nov. 6, 1969, Pat. No. 3,611,711. This application Mar. 19, 1971, Ser. No. 126,105

Int. Cl.[2] F02B 37/00

U.S. Cl. 92—49 6 Claims



1. A device for generating a signal in response to a pressure of a fluid taken from at least two different points of a fluid passageway comprising: reference means displaceable in response to force applied thereto; means for applying a fluid pressure from a first point of the passageway to said reference means to create a first force acting thereon; means for obtaining a pressure differential between the fluid pressures taken from said first point and a second point of the passageway and applying said pressure differential to said reference means to create a differential force acting on said reference simultaneously with said first force; means coupled to said reference means for transmitting the amount of displacement of the reference means in proportion to the sum of the first force and differential force; and means responsive to an atmospheric pressure drop below a predetermined value, said atmospheric responsive means including means for applying an additional force to said reference means when the atmospheric pressure decreases below the predetermined value to adjust the amount of displacement of the reference means once the atmospheric pressure has decreased below the predetermined value.

3,941,036

CONTINUOUS FILTER ROD MAKING MACHINES

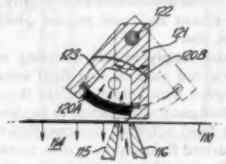
Desmond Walter Molins, London, England, and Francis Auguste Maurice Labbe, Neuilly-sur-Seine, France, assignors to Molins Limited, England

Continuation-in-part of Ser. No. 319,615, Dec. 29, 1972, abandoned. This application Apr. 5, 1974, Ser. No. 458,440

Claims priority, application United Kingdom, Jan. 7, 1972, 891/72; Feb. 11, 1972, 6614/72

Int. Cl.[2] A24C 5/50

U.S. Cl. 93—1 C 19 Claims



1. A method of forming a filler for a continuous cigarette filter rod comprising the steps of feeding a wide band of filaments of filter material into a wide shallow gap formed by two spaced moving surfaces to each of which suction is applied, the suction surfaces moving at a lower speed than the speed at which the band is fed so that the band is axially shrunk to crimp the filaments and the axially shrunken band is held to the suction surfaces, releasing the shrunken band from one of the surfaces and then narrowing the band to form a filler while retaining the crimp in the filaments produced by the axial shrinking.

3,941,037

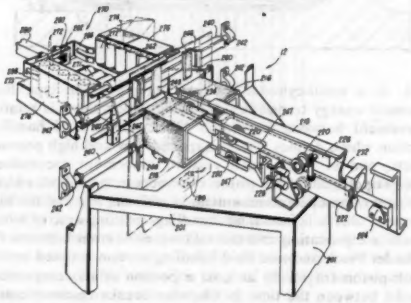
CASE FORMING AND TRANSFERRING MACHINE

Donald G. Reichert, Tarpon Springs, Fla., assignor to A B C Packaging Machine Corporation, Tarpon Springs, Fla.

Filed Oct. 7, 1974, Ser. No. 512,980

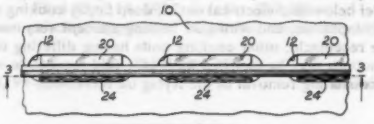
Int. Cl.[2] B31B 1/44; B65B 47/00

U.S. Cl. 93—51 R 9 Claims



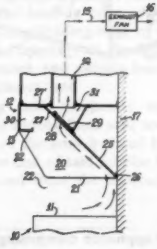
1. In a packaging machine having means for forming a flat case blank into an open case at a case forming station including a forming head mounted for movement along a linear path terminating between parallel sets of compression rollers and means for transferring the formed open cases from the case forming station to a product stacking and packing station the improvement comprising means for moving selected member rollers of one of said sets between a position relatively remote from and a position relatively close to said path and wherein said transferring means includes case gripping means and means for moving said case gripping means along a path passing closely adjacent said rollers remote position.

3,941,038
DIE-CUTTING
Thomas Desmond Bishop, Solihull, England, assignor to The Deritend Engineering Co. Ltd., Birmingham, England
Filed Nov. 6, 1974, Ser. No. 521,347
Claims priority, application United Kingdom, Mar. 16, 1974, 11771/74
Int. Cl.² B31B 1/14; B26D 7/26
U.S. Cl. 93—58.4 9 Claims



1. A forme in which a rule is held securely and accurately in position, comprising a plate-like support provided with a pattern of slots, each slot being wider than the thickness of the rule, the rule being mounted in the slots, at least two slots being aligned, with an intervening gap, and the rule having a notch to accommodate said gap, and a retaining element having a press fit beside the rule in each slot, said element consisting of a corrugated strip of sheet metal, the corrugations being rectilinear and parallel to one another, running transversely of the rule, and having linear contact with the rule and with the side of the slot, and the force exerted against the rule and the side of the slot by the corrugated strip being great enough to hold the rule securely and accurately in position and to prevent tilting of the rule.

3,941,039
COOKING FUME REMOVAL
David William Kinney, Arlington Heights, Ill., assignor to Air Distribution Associates, Inc., Wood Dale, Ill.
Filed Nov. 18, 1974, Ser. No. 524,505
Int. Cl.² F23J 11/00
U.S. Cl. 98—115 K 13 Claims

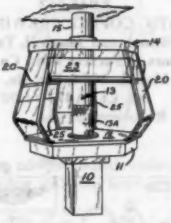


1. In an exhaust hood used above a cooking appliance having a top with front, sides and a rear at approximately a first level, which hood has a front with a bottom terminus spaced at a second level above the top of the appliance, sides and a back, said hood having an exhaust duct at the top which is adapted to be connected to means for withdrawing air from within the hood so that an air pressure below ambient exists within the hood, the improvement comprising:

side wall means at each side extending downwardly from the hood at said second level, said side wall means defining openings between said levels which openings are between 35 and 50 percent of the area between said levels in a generally vertical plane, whereby at said sides said air pressure below ambient causes streams of air to flow inwardly above the cooking surface generally toward the center of the cooking surface; and

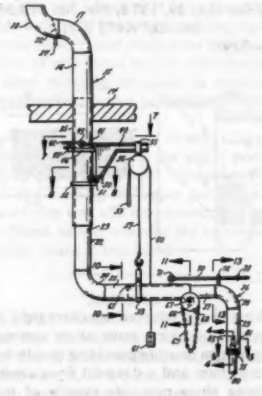
a wall slanting upwardly from rear to front, said slanting wall extending approximately from one side wall means to the other side wall means, having a bottom between said levels and having a top not substantially lower than said second level.

3,941,040
FUME HOOD
Arthur W. Carlson, Muskegon, Mich., assignor to E. H. Sheldon and Company, Muskegon, Mich.
Filed Feb. 12, 1975, Ser. No. 549,349
Int. Cl.² F23J 11/00
U.S. Cl. 98—115 LH 8 Claims



1. A fume hood comprising: a base having a polygonal horizontal cross section including edges which are alternately relatively long and relatively short, the longer edges defining work areas; a work top on said base; a central hollow pedestal adapted for mounting on a floor and carrying said base; a central tubular column extending upwardly of said base and defining a lower apertured region for intake of gases; a plenum above said base and defining the top of said fume hood, said plenum providing intake apertures above said work areas; transparent viewing screens extending between the relatively shorter edges of said base and said plenum to separate said work areas; and exhaust conduit means for exhausting gases collected from within said hood by said tubular column and by said plenum.

3,941,041
UPDRAFT EXHAUST SYSTEM
Elmer E. Sprout, 10749 Gail Court, St. Louis, Mo. 63123
Filed May 22, 1974, Ser. No. 472,100
Int. Cl.² F23J 11/00
U.S. Cl. 98—115 R 14 Claims



1. In a stack assembly for use in conducting noxious gases from an enclosure: piping having an outlet portion adapted to be fixed to a wall of the enclosure to discharge therethrough,

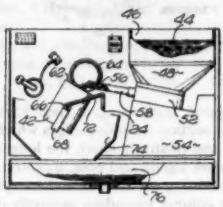
the piping having an inlet for disposition over the end of an exhaust or like pipe as of a vehicle engine having variable positions; the piping having rigid but movably interfitting portions providing means for horizontal, vertical, and angular movements of the inlet, relatively to the outlet portion, the last-named including vertically telescoped pipe portions, one rotatable in the other, and means for holding them against separation while permitting them relative rotation about their common vertical axis, and incorporating suspension means for suspending the rest of the piping from the outlet portion.

3,941,042

AUTOMATIC COFFEE BREWING SYSTEM

Daniel M. Wells, Hemet, and James H. Tarrant, El Toro, both of Calif., assignors to Farmer Bros. Co., Torrance, Calif.

Filed Mar. 1, 1974, Ser. No. 447,195
Int. Cl.² A47J 31/00
U.S. Cl. 99—289 R **4 Claims**



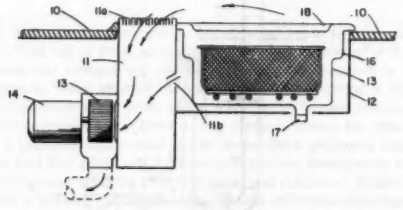
1. An automatic coffee brewing system comprising:
a chamber for brewing coffee therein, said chamber being of generally cylindrical configuration and having a filter therein;
said filter having a water inlet expanding from a first end of said filter and extending through said chamber and exiting a second end of said filter, a sprayhead coupled to said water inlet of said filter for directing water from said sprayhead to the outer surface of said filter; and
means providing an outlet path for water passing through said filter to an outlet spigot.

3,941,043

RANGE WITH REMOVABLE DEEP FAT FRYER UNIT

Joseph J. Cerola, and Louis J. Jenn, both of Indianapolis, Ind., assignors to Jenn Air Corporation, Indianapolis, Ind.

Filed Oct. 29, 1974, Ser. No. 518,357
Int. Cl.² A47J 27/12
U.S. Cl. 99—339 **5 Claims**



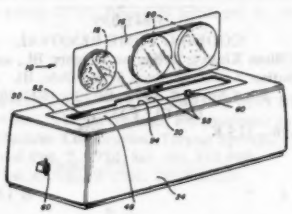
1. A cooking range adapted to alternately accommodate differing electrical cooking units at its countertop cooking surface comprising a housing providing in side-by-side relation an air intake plenum and a deep-fat fryer cavity, said intake plenum opening along one side margin of said cavity and adapted to draw in cooking fumes from said fryer cavity when the plenum pressure is below atmospheric, said fryer cavity being formed by an opened-topped relatively deep receptacle extending downwardly from the cooking surface into the fryer cavity formed by the housing, the base of said receptacle being provided with a drain aperture and an electrical outlet on the receptacle side wall adjacent its upper margin, a heating element having an offset terminal plug and a sinuous portion formed in a plane spaced from the electrical terminal plug, said terminal plug being adapted to be inserted in said electrical outlet and the said sinuous portion of the heating element being thereby disposed closely adjacent to the base of said receptacle, and a removable fryer basket received within said receptacle, whereby with frying oil filling said receptacle to a level below said electrical outlet, deep fat fry cooking may be accomplished, and with said heating element removed from the receptacle, other cooking units having differing cooking functions may be installed to overlie said receptacle without necessitating removal of the frying oil therefrom.

3,941,044

ELECTRICAL APPLIANCE FOR HEATING FOODS AND FOOD PACKAGE THEREFOR

Costas E. Goltsos, Weston, Mass., assignor to Teckton, Inc., Waltham, Mass.

Filed Nov. 21, 1973, Ser. No. 417,907
Int. Cl.² A47J 37/08
U.S. Cl. 99—391 **11 Claims**



1. An electrical appliance comprising:
a housing having an elongate opening therein;
a carriage including a pair of spaced side walls formed from a material which is opaque to radiation having selected characteristics, each of said side walls having at least two regions which present different degrees of transparency to said radiation;
means mounting said carriage for movement between an idle position in which said carriage is disposed in alignment with said elongate opening and in proximity to said opening to enable a plurality of items to be heated to be inserted together through said opening and into said carriage between said side walls thereof and a working position remote from said opening; and means for generating said radiation having said selected characteristics and being mounted within said housing on opposite sides of said carriage, said radiation generating means being located with respect to said carriage so that when said carriage is in its working position, said radiation transparent regions of said carriage side walls will be in alignment with said radiation generating means.

3,941,045

APPARATUS FOR PULPING, SLICING AND/OR DESTONING VEGETABLES AND FRUITS

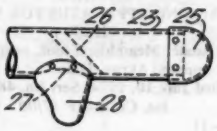
John Mathew Clancy, 4/58 Mckenzie Ave., Wollongong, N.S.W. 2500; Rodney William Howard, 4/35 Virginia St., North Wollongong 2500; Brian Leslie Wiese, 12 Macquarie St., Wollongong, N.S.W.; Richard Eben Hipsley, 1/26 Waltangi St., Gwynneville, N.S.W. 2500, and Christopher Patrick Kennedy, 4/58 McKenzie Ave., Wollongong, N.S.W. 2500, all of Australia

Filed Sept. 14, 1973, Ser. No. 397,298

Claims priority, application Australia, Sept. 25, 1972, 557/72

Int. Cl.² A23N 4/22

U.S. Cl. 99—556 6 Claims



1. An apparatus for slicing and destoning stone fruit comprising:

a receptacle for receiving the fruit having a base, at least one side wall and an opening in the top thereof, said receptacle being rotatable about a vertically extending axis,

a tubular body opening into the side wall of said receptacle and extending radially of the axis of rotation of said receptacle, said tubular body being rotatable with said receptacle such that said tubular body has a leading and a trailing edge,

a plurality of spaced apart blades mounted within and extending across said tubular body intermediate the ends thereof, the longitudinal axis of said blades being angled relative to the longitudinal axis of said tubular body outwardly towards the leading edge of the tubular body, there terminating in a leading edge of said blades

structure defining an aperture in the leading edge of said tubular body adjacent, and radially inwardly of, the leading edge of said blades, and

means for rotating said receptacle and tubular body whereby said fruit moves from said receptacle into said tubular body where the fruit is sliced by said blades and projected from the end of said tubular body and the fruit stones are projected from the aperture in said tubular body.

3,941,046

REFUSE COMPACTOR APPARATUS

Jimmy D. Smith, P. O. Box 94176, Oklahoma City, Okla. 73109

Filed Aug. 29, 1974, Ser. No. 501,678

Int. Cl.² B30B 15/30

U.S. Cl. 100—45 18 Claims

1. A refuse compacting apparatus comprising:

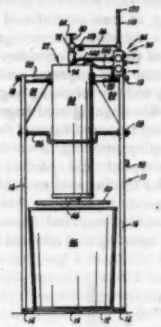
a fluid powered ram including a cylindrical housing and piston means extensible from the housing;

means for supporting the ram in a vertically elevated position to facilitate compaction of refuse positioned therebelow;

an injection pump including:

an injection pump sleeve connected to said piston means and movable therewith relative to said cylindrical housing; and

an elongated tube projecting concentrically into said sleeve and connected to said cylindrical housing for retention in a fixed position as said sleeve moves relative to said housing; and



a body of sanitizing additive liquid retained in said housing and communicating with the interior of said elongated tube.

3,941,047

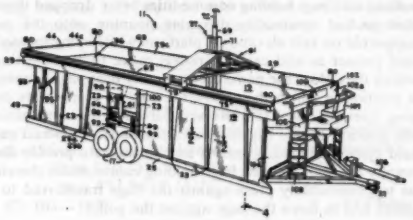
COTTON MODULE BUILDER

Franklin P. Orlando, San Jose, and Johan Hendriks, Saratoga, both of Calif., assignors to FMC Corporation, San Jose, Calif.

Filed Mar. 3, 1975, Ser. No. 554,885

Int. Cl.² B30B 1/32, 15/32

U.S. Cl. 100—100 13 Claims



1. In a cotton handling machine comprised of frame means including side walls, and a front wall and a rear wall interconnecting said side walls, said frame means being open at the top and at the bottom thereof. and compactor means mounted on the upper portion of said frame means, said compactor means including a platen movable vertically in opposition to the ground so as to compress cotton or the like within said frame means,

the improvement comprising a closed triangular frame beam secured to and forming the upper portion of each of said side walls, and closed triangular frame beams secured to and forming the upper portions of said front wall and said rear wall and interconnecting said side wall triangular frame beams whereby the torsional resistance of said frame means is increased.

3,941,048

APPARATUS FOR LOADING GOODS ON A PALLET

Noboru Oe, and Yozi Tsuboi, both of Kakogawa, Japan, assignors to Okura Yusoki Kabushiki Kaisha, Kakogawa, Japan

Filed Nov. 6, 1974, Ser. No. 521,258

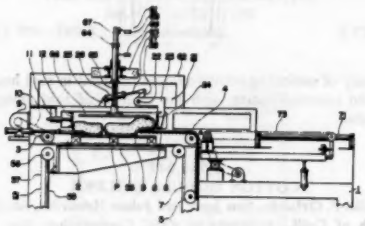
Claims priority, application Japan, July 19, 1974, 49-83582

Int. Cl.² B65G 57/24

U.S. Cl. 100—215 3 Claims

1. An apparatus for loading goods on a pallet comprising a frame, a packed commodity dropping opening formed in said

frame, said opening having front and rear edges, a pair of guides disposed on opposite sides of said packed commodity dropping opening, at least one of said pair of guides being a movable guide, a number of carriage rollers mounted for movement on said packed commodity dropping opening between the front and rear edges of said opening to close and open the opening and for receiving bags holding commodities thereon, said guides aligning said bags received on said carriage rollers, a fixed stopper disposed forwardly of said packed commodity dropping opening, a vertically movable stopper disposed rearwardly of said packed commodity dropping opening, means for forcing said movable stopper into engagement with said goods to position said goods, an elevational platform elevationally mounted beneath said packed commodity dropping opening and adapted to move upwardly and



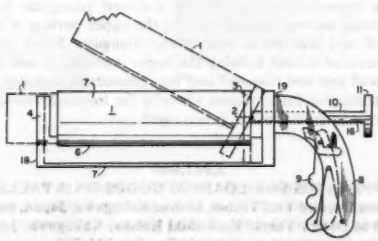
downwardly while supporting a pallet thereon, and a presser mounted above said packed commodity dropping opening and supported for vertical movement by a cylinder to press against bags holding commodities therein received on said carriage rollers, said bags holding commodities being dropped through said packed commodity dropping opening onto the pallet supported on said elevational platform while being pressed by said presser as said carriage rollers move from a position in which they close the packed commodity dropping opening to a position in which they leave the packed commodity dropping opening open, said presser and said guides maintaining the position of said bags as they are dropped onto said pallet, said cylinder including means for moving said presser downwardly together with the bags holding commodities therein so as to continuously press against the bags transferred to the pallet and to force the bags against the pallet.

3,941,049

CONTAINER CRUSHER

Russell Britt, Eureka, Calif., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Mar. 24, 1975, Ser. No. 561,055
Int. Cl.² B30B *1/04*
U.S. Cl. 100—274 **6 Claims**



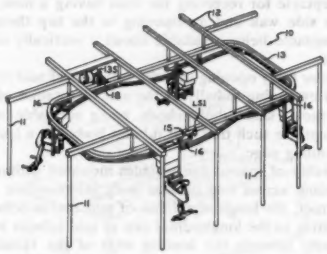
1. A device for crushing containers comprising, a stationary housing adapted with an end plate, said end plate supporting a cam on the surface thereof, a pivotable cover when in closed position partially covers said housing, means to slide said cover along the longitudinal axis of said housing, said cam including locking means to maintain locked said cover in the closed position when said cover slides along a fixed portion of the length of said housing, means to pivot said cover to an angular relationship with said housing when said locking means are not engaged, ratchet means to forcibly slide said cover, said cover adapted with a presser plate substantially parallel to said end plate when the cover is in a closed or locked position, said pivot means pivotly connecting said ratchet means to the cover, a mounting plate mounted to said housing on an end opposed to said end plate, a portion of said ratchet means passing through said mounting plate and being connected to said presser plate.

3,941,050

COLD BRANDING APPARATUS FOR VULCANIZED TIRES

Troy E. Martindale, Memphis, Tenn., assignor to The B. F. Goodrich Company, Akron, Ohio

Filed July 10, 1974, Ser. No. 487,056
Int. Cl.² B41F *17/00*
U.S. Cl. 101—11 **15 Claims**

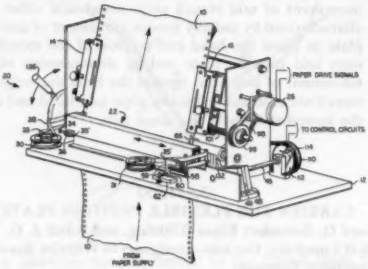


7. An apparatus for the branding of pneumatic tires comprising an endless conveyor means; a plurality of stations along the path of said conveyor means; a plurality of branding machines; said conveyor means supporting said branding machines in spaced relationship for movement intermittently from one station to another in a closed path; conveying means at each of said stations for supplying and taking away tires; each branding machine having means for supporting a tire thereon; a stationary platen on said tire support means for supporting an inner portion of a sidewall of a tire; a bracket mounted on said support means for supporting the lower portion of a tire; cylinder means connected to said bracket for adjusting the position of said bracket relative to said stationary platen; a moveable platen mounted on said branding machine for movement toward and away from said stationary platen; said moveable platen having a branding head thereon; first actuating means operatively connected to said moveable platen for selectively adjusting the angular position of said moveable platen relative to said stationary platen; second actuating means connected to said moveable platen for movement thereof toward said stationary platen to carry said branding head into engagement with the sidewall of a tire supported by said stationary platen, and held by said tire supporting means; and means for heating said moveable platen and branding head to vulcanize an indicia on the sidewall of a tire upon engagement of the sidewall of a tire by said heated branding head.

3,941,051
PRINTER SYSTEM

Gordon B. Barrus, El Segundo; Leo J. Emenaker, Playa del Rey, and Raymond F. Melissa, Inglewood, all of Calif., assignors to Printronix, Inc., Irvine, Calif.

Filed Aug. 8, 1974, Ser. No. 495,830
Int. Cl.² B41J *5/08*
U.S. Cl. 101—93.04 **48 Claims**



1. A mechanical dot matrix printer system comprising:

means for feeding paper incrementally past a printing line position;

a reciprocable hammer bank disposed along said printing line position, each of the hammers including a dot printing means for imprinting a dot when the hammer is impulsed toward the printing line position, said hammer bank being reciprocable along a selected length of printing line;

means coupled to reciprocate said hammer bank bidirectionally with substantially constant velocities in each direction;

a plurality of hammer actuating means disposed adjacent said hammer bank and reciprocating therewith, said hammer actuating means each being associated with a different one of the hammers;

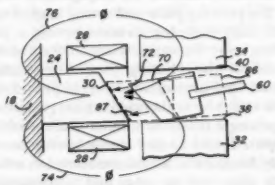
means responsive to input data to be printed for independently actuating said hammers at selected times during motion thereof in each direction of movement; and

means coupled to said means for feeding for advancing said paper incrementally during motion reversals of said shuttle mechanism.

3,941,052
PRINT HAMMER APPARATUS WITH ANGULARLY DISPOSED MATING HAMMER AND POLE FACES TO PREVENT CONTACT BOUNCE

Warren L. Dalziel, Monte Sereno, Calif., assignor to Shugart Associates, Inc., Sunnyvale, Calif.

Filed Apr. 29, 1974, Ser. No. 464,851
Int. Cl.² B41J *9/42*
U.S. Cl. 101—93.48 **14 Claims**



1. Print hammer apparatus comprising:

a resilient member having a fixed end and a movable end, said movable end being movable between a cocked position and a striking position;

hammer means affixed to said movable end and carried thereby over an arcuate path between said cocked position and said striking position, said hammer means including an impact head and a flag member, said flag member being of magnetic material and having a flag face with a surface which is at all points angularly disposed at an angle other than normal to said path;

a stator pole piece disposed in alignment with said path and having an angularly disposed pole face for matingly engaging said flag face;

side pole means disposed laterally of said path between said pole piece and said striking position, said side pole means and said pole piece forming a magnetic flux circuit;

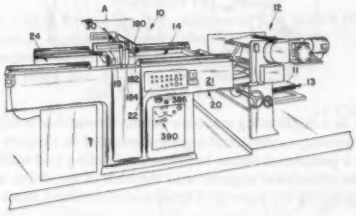
magnetic flux generating means coupled to said pole piece and to said side pole means for generating magnetic flux through said circuit and operative to develop a magnetic force for causing said hammer means to move against the influence of said resilient member and into said cocked position with said flag face engaging said pole face; and

electromagnetic means disposed along said circuit for momentarily developing magnetic flux in opposition to the flux developed in said circuit by said generating means thereby reducing said magnetic force and allowing said hammer to move along said path into said striking position under the influence of said resilient member, said resilient member and said generating means being operative to thereafter cause said hammer means to be returned along said path to said cocked position where said flag face impacts said pole face and whereby the interaction of said engaging faces and said side pole means and the magnetic relationships between said pole piece, said flag member and said side pole means causes said hammer means to experience substantially no contact bounce.

3,941,053
PRINTING PRESS

James A. Black, Kent City, and James O. Rop, Grandville, both of Mich., assignors to James A. Black, Kent City, Mich.

Filed Sept. 27, 1973, Ser. No. 401,383
Int. Cl.² B41F *15/20*, *15/36*, *15/44*
U.S. Cl. 101—124 **23 Claims**



20. In a screen printing press of the type feeding successive segments of printing stock into a print station and registering the stock with respect to a printing cylinder and screen, improved means providing side registration of said stock comprising:

a frame for said printing press;

a stock support surface coupled to said frame for receiving and supporting printing stock thereon;

means for supplying printing stock to said stock support surface;

a block movably positioned on said stock support surface and including a plate movably coupled thereto by means of a rotatable threaded member, said plate forming an abutment surface for printing stock;

adjustment means extending to an edge of the press and cooperating between said block and said plate to permit adjustment of said plate relative to said block wherein said adjustment means engages said threaded member to rotate said member providing relative motion between said plate and said block and comprises a first gear mounted to said threaded member; a pair of spaced support arms fixedly coupled to said stock support surface; an elongated gear rotatably coupled between ends of said arms to continuously engage said first gear as said block is moved; and means for rotating said elongated gear whereby said first gear rotates to adjust the position of said plate with respect to said block;

vacuum pull-over means movably mounted within said support surface for lateral motion with respect to said feed direction of said printing stock, said pull-over means including a plurality of spaced apertures opening toward said stock support surface for gripping printing stock when positioned thereon and when vacuum is applied to said pull-over means; and

drive means coupled to said pull-over means for moving said vacuum pull-over means to urge printing stock into a side registered position against said plate.

3,941,054

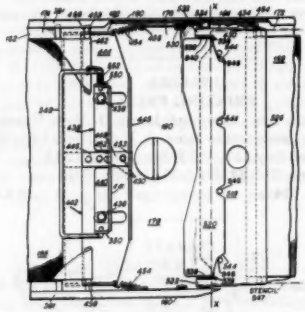
STENCIL GRIPPING APPARATUS FOR A DUPLICATING MACHINE

Edward M. Springer, Chicago, Ill., assignor to Heyer Inc., Chicago, Ill.

Division of Ser. No. 186,956, Oct. 6, 1971, Pat. No. 3,835,772. This application May 13, 1974, Ser. No. 469,111

Int. Cl.² B41F *1/28, 27/06*

U.S. Cl. 101—409 **4 Claims**



1. In a duplicating machine having a rotatable printing drum comprising a cylindrical segment adapted to support a stencil, and a peripheral recess between the leading and trailing edges of the cylindrical segment and the ends of the drum, apparatus for gripping the apertured head end of a stencil sheet comprising:

a take on plate in said recess having an ascending outer surface which increases in distance from the drum axis toward and terminates adjacent the leading edge of said cylindrical segment, said surface having a first section adjacent said leading edge which is initially engageable with an impression roll to guide said impression roll over said leading edge onto said cylindrical segment, said surface having a second section remote from said leading edge with a series of stencil aperture engaging studs thereon, said studs being disposed within said recess closer to the drum axis than said first section enabling an impression roll to engage said first section while clearing said studs;

means for removably fastening the apertured head end portion of a stencil sheet to said studs in a position where it is protected against ink-staining and automatically alignable with the drum axis, said means including a stencil plate mounted on arms at opposite ends of the drum spaced apart a distance less than the width of a standard stencil sheet, said arms having leading edges abuttable, along a line parallel to the axis of said drum, edgewise with the head end edge of a stencil sheet engaged with said studs, said arms being pivotally supported within said recess about an offset axis located radially inwardly from said take on plate, whereby pivotal closing movement of said stencil plate about said offset axis is characterized by radially inward movement of said stencil plate to press the head end portion of the stencil sheet onto said take on plate and by simultaneous edgewise movement of said arms against the head end edge of the stencil sheet to automatically align said head end edge of the stencil sheet with the drum axis.

3,941,055

CARRIER FOR FLEXIBLE PRINTING PLATES

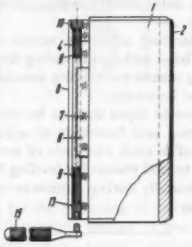
Eduard O. Semmler; Klaus Güthling, and Adolf J. G. Meyer, all of Luneburg, Germany, assignors to Wilhelm Barenschee, Luneburg, Germany

Continuation of Ser. No. 331,107, Feb. 9, 1973, abandoned. This application Oct. 18, 1974, Ser. No. 515,854

Claims priority, application Germany, Feb. 16, 1972, 2207138

Int. Cl.² B41F *27/06, 27/12*

U.S. Cl. 101—415.1 **11 Claims**



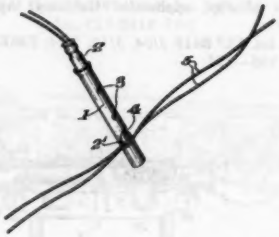
1. A device for clamping flexible printing plates having a bent-over end on a curved saddle plate to be attached to a plate cylinder or the like, wherein clamping means is provided at at least one end of said saddle plate and is of a thickness less than that of said saddle plate, said clamping means comprising a clamping element adapted for engagement with the bent-over end of the printing plate and spring loaded in the clamping direction, said clamping element having a projection or nose extending over the entire width of the saddle plate, the bent-over end of the printing plate being adapted to be hooked behind said projection which is provided on torsion spring means attached to the saddle plate, said torsion spring means comprising a rotatable tubular shaft in which a torsion spring is disposed, said torsion spring having one end thereof non-rotatably fastened to a holder mounted in a fixed position on the saddle plate and the other end non-rotatably mounted on the tubular shaft and said torsion spring being installed under initial stressing in accordance with the spring loading to be imparted to the projection.

3,941,056

BLASTING CAP ADAPTER FOR SEVERING BLASTING CIRCUIT LEADS

Florian B. Janoski, Allentown, Pa., assignor to Atlas Powder Company, Wilmington, Del.

Filed June 18, 1974, Ser. No. 480,379
Int. Cl.² F42B 19/12
U.S. Cl. 102—22 7 Claims



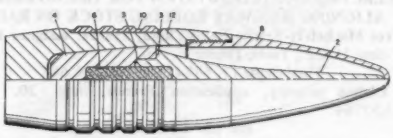
1. An assembly for attachment to the circuit leads for a primary explosive charge for severing the circuit leads immediately after the primary charge circuit has been energized comprising a tube, a millisecond delay blasting cap inserted in said tube, said cap having its own leg wires connected to the primary charge circuit, means cooperating with the tube wall and the cap for retaining the cap firmly in place within the tube, a slot extending through the tube wall transversely of the longitudinal axis of the tube, which slot receives the primary explosive charge circuit leads for attaching the assembly to said leads.

3,941,057

ARMOR PIERCING PROJECTILE

Albert H. Peterson, Salt Lake City, and Howard L. Peterson, Bountiful, both of Utah, assignors to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 347,742, April 4, 1973, abandoned. This application Oct. 9, 1974, Ser. No. 513,369
Int. Cl.² F42B 13/06, 13/14
U.S. Cl. 102—52 6 Claims



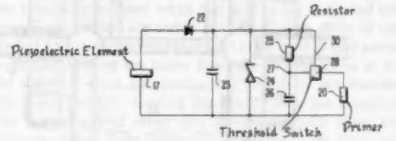
1. An armor piercing incendiary projectile comprising:
body means;
penetrator means contained within said body means, said penetrator means having a maximum length-to-diameter ratio of 5:1, said penetrator means having a tip and a base, the shape of said penetrator means being an envelope from tip to base substantially defined by an exponential curve of revolution about its longitudinal axis, the exponent of said curve being greater than one, said shape providing weight distribution that increases the mass on the outer periphery of the penetrator to maximize the polar moment of inertia to provide favorable stability characteristics;
support means interconnecting said body means and said penetrator means, said support means being made from a ductile metal;
wind cover means surrounding said penetrator means and connected to said body means to provide a low drag profile; and
band means circumferentially mounted over said body means to spin stabilize the projectile.

3,941,058

ELECTRIC IGNITION DEVICE

Heinz Gawlick, Furth, Bavaria, and Uwe Brede, Schwaig, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Germany

Filed Mar. 22, 1974, Ser. No. 453,801
Claims priority, application Germany, Mar. 24, 1973, 2314709
Int. Cl.² F42C 11/06
U.S. Cl. 102—70.2 GA 19 Claims



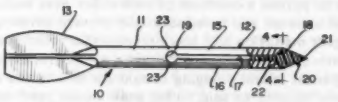
1. An electric fuze, especially for hand grenades, comprising power source means responsive to a force effect for supplying power output, delay unit means responsive to the power output of said power source means for providing an output for igniting a primer at a time period delayed with respect to the time of supply of power output by said power source means, said delay unit means being an RC circuit means having a variable delay period and including at least a plurality of one of resistors and capacitors connected in one of a series and parallel connection, said plurality of one of resistors and capacitors being electrically connected together by electricl leads disposed to be open-circuited so as to interrupt the electrical connection therethrough for changing the delay period of said delay unit means in a predetermined manner, and means for severing at least one of said electrical leads so as to provide an open circuit thereof thereby changing the delay period.

3,941,059

FLECHETTE

Donald R. Cobb, Evansville, Ind., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 18, 1967, Ser. No. 611,534
Int. Cl.² F42B 11/10
U.S. Cl. 102—91 14 Claims



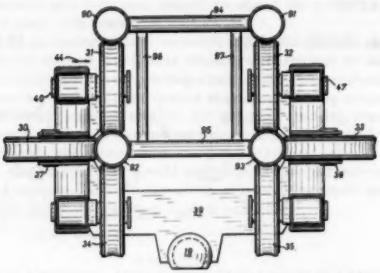
1. A flechette comprising: an elongated, one-piece member having a penetrating nose end and a tail portion defining means for orienting said member in flight to present said nose end forwardly; and means for causing a spreading formation of said nose end as an incident of striking engagement thereof with a target comprising means dividing said nose end into a plurality of deflectable integrally joined prongs and means at the rear end of said dividing means weakening said member thereat to facilitate spreading deformation of said prongs.

3,941,060

MONORAIL SYSTEM

Paul Morsbach, Martinsholzerstrasse 13a, D-8131 Aufkirchen, Germany

Filed Feb. 8, 1974, Ser. No. 440,812
Claims priority, application Germany, Feb. 9, 1973, 2306385; June 8, 1973, 2329423
Int. Cl.² B61B 3/00, 12/02
U.S. Cl. 104—247 6 Claims



1. A monorail system comprising track means and at least one vehicle suspended on said track means; said vehicle comprising roller gear means on said track means, said track means comprising a substantially rigid structure of four interconnected elongated elements selected from the group consisting of tubes, bars, rods and rails, said structures having a substantially rectangular cross-section with one of said elongated elements arranged at each corner of said rectangular cross-section, car means, and at least one support arm connected with said car means; said roller gear means and said track means being operably connected to permit movement of said roller gear means along said track means and to substantially prevent pivoting of said roller gear means about said track means in any direction with respect to said track means; said roller gear means including support roller means rotatably arranged on a first set of axes and guide roller means rotatably arranged on a second set of sxes, said first set of axes being substantially perpendicular to said second set of axes; said roller gear means being movably connected with said support arm of said vehicle to permit lateral swinging of said car means and said support arm relative to said roller gear means; and means for damping said lateral swinging or pivoting of said car means and said support arm.

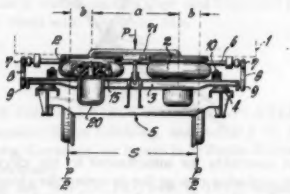
3. A monorail system comprising track means and at least one vehicle suspended on said track means; said vehicle comprising roller gear means on said track means, car means, and at least one support arm connected with said car means; said roller gear means and said track means being operably connected to permit movement of said roller gear means along said track means and to substantially prevent pivoting of said roller gear means on said track means; said roller gear means being movably connected with said support arm of said vehicle to permit lateral swinging of said car means and said support arm relative to said roller gear means; and means for damping said lateral swinging or pivoting of said car means and said support arm, said means for damping comprising a pair of substantially coaxial elongated components for mutual displacement relative to each other in the direction of the common axis thereof, said axis being displaced from and substantially coplanar with said support arm in a plane perpendicular to direction of swing thereof when said support arm is disposed normal to the plane of said track means, said means for damping havig one end connected with said support arm and the other end thereof connected with said roller gear means, said mutual displacement of said elongated components having a continuous increase of the damping effect per angular unit with increasing angle of the car with respect to the free hanging normal position.

3,941,061

PNEUMATIC RAILWAY CAR SUSPENSION

Manfred Schindehütte, Kassel, and Hans Dieling, Rhunda, both of Germany, assignors to Wegmann & Co., Kassel, Germany

Filed Apr. 16, 1973, Ser. No. 351,758
Claims priority, application Germany, Apr. 14, 1972, 2218089
Int. Cl.² B61F 3/04, 5/10, 5/24; F16F 9/04
U.S. Cl. 105—135 6 Claims



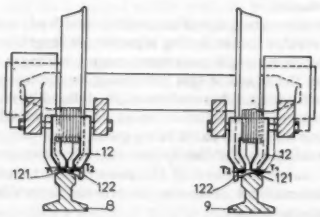
1. A rail vehicle with swivel trucks comprising at least two air springs connected directly with one another through a clear passage and disposed symmetrically with the longitudinal central plane of said rail vehicle between a car body and each swivel truck, the distance between the centers of said air springs being smaller than the track gauge of the wheels, said air springs having connected thereto means for instantaneous discharge of air should one of said air springs fail, said car body being connected to said swivel truck by a stabilizing resilient linkage comprising a torsion bar disposed across said car body, said torsion bar connected rigidly at each end to a horizontal lever which extends lengthwise of said truck, each of said horizontal levers flexibly connected to a connecting rod which runs generally vertical and is connected at its opposite end from said horizontal lever to an intermediate support on the swivel truck frame or to the swivel truck frame itself.

3,941,062

ELECTROMAGNETIC SYSTEM FOR TRANSVERSELY ALIGNING RAILWAY ROLLING STOCK ON RAILS

Yves Machefert-Tassin, Saint-Cloud, France, assignor to Societe M.T.E., Paris, France

Filed Sept. 17, 1974, Ser. No. 506,688
Claims priority, application France, Sept. 20, 1973, 73.33744
Int. Cl.² B61D 1/00
U.S. Cl. 105—157 R 4 Claims



1. An electromagnetically guided railway rolling element, comprising a plurality of electromagnets outside an interaxle wheelbase of the element, each of said magnets being positioned such that, in use, it overlies a rail and is separated from the rail by an air-gap, two poles for each of said magnets which

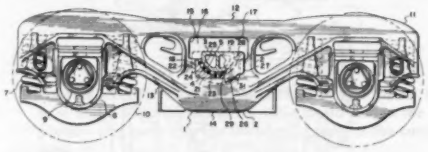
are aligned transversely of the rails and are offset relative to a vertical medial plane of the rail; and means for connecting said electromagnets to axle-boxes of the element preventing transverse movement therebetween.

3,941,063

TRUCK SIDE FRAME AND BOLSTER CONNECTION

Geoffrey Wilton Cope, Williamsville, N.Y., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 23, 1974, Ser. No. 517,111
Int. Cl.² B61F 3/00
U.S. Cl. 105—203 7 Claims



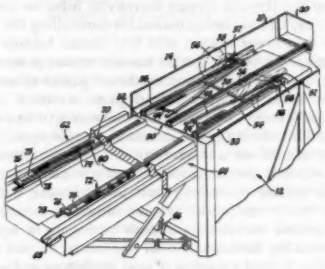
1. In a railroad freight car truck having side frames interfacing with a bolster, said side frames having a bolster window formed by an upper compression member, a lower tension member and a pair of vertical columns for receiving bolster ends, the improvement comprising the bolster ends having a convex undersurface supported within the window by resilient pad means conforming to its surface and a concave surface on the tension member to provide positive squaring at the side frame — bolster interface.

3,941,064

APPARATUS FOR LOADING AND SECURING VEHICLES IN A SHIPPING CONTAINER

Mitchell Choly, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 24, 1974, Ser. No. 517,441
Int. Cl.² B60P 7/08; B61D 45/00; B65D 85/68
U.S. Cl. 105—368 R 2 Claims



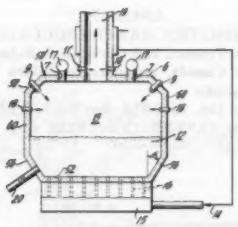
1. In combination with a container for shipping vehicles, said container having a floor portion including positioning and restraint means for securing a vehicle thereto, said positioning and restraint means including two laterally spaced guide rails fixed to said floor portion and adapted to slidably receive a pair of tie-down devices attached to said vehicle adjacent the rear end thereof, each of said guide rails having an outer end which initially receives the tie-down device and an inner end, a latch mechanism operatively associated with the inner end of each of said guide rails for restraining said pair of tie-down devices from movement in a vertical direction and along the longitudinal axis of said each of the guide rails, said latch mechanism comprising a lock member pivotally connected to said container for movement between a locked position for restraining the tie-down device and an unlocked position wherein said tie-down device is unrestrained, means for moving said lock member between the locked and unlocked positions, said latter mentioned means including an actuator lever having one end pivotally supported by the lock member and the other end supported by the container for movement along a line located adjacent to and parallel to the associated guide rail, said other end of the actuator lever being normally located adjacent the outer end of the associated guide rail in a first position wherein said lock member is located in the locked position and being movable towards the inner end of the guide rail to a second position wherein said lock member is located in the unlocked position, a vehicle loader mechanism having a base adapted to be located in horizontal alignment with said floor portion, a pair of power extendable elongated pusher bar members carried by said loader mechanism and adapted to register with and move into said pair of guide rails, each of said pusher bar members having an outer end for contacting one portion of a tie-down device for loading said vehicle into the container when the pusher bar is moved into the associated guide rail, and a cam fixed with each of said pusher bar members for engaging said other end of said actuator lever and moving the latter from the first position to the second position when the pusher bar members are inserted into the guide rails for loading the vehicle into the container and for engaging said other end of said actuator lever and returning the latter from the second position to the first position when the pusher bar members are retracted from the guide rails so as to automatically lock said tie-down devices to said container.

3,941,065

FLUIDIZED BED FURNACE FOR BURNING PARTLY DEHYDRATED SLUDGE AND METHOD OF BURNING SLUDGE IN A FLUIDIZED BED FURNACE

Erhard Albrecht, Essen, Germany, assignor to Rheinstahl AG, Germany

Filed Nov. 1, 1974, Ser. No. 520,208
Claims priority, application Germany, Nov. 9, 1973, 2356058
Int. Cl.² F23G 5/12
U.S. Cl. 110—8 F 11 Claims

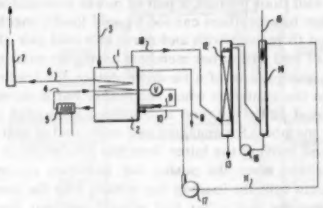


1. A fluidized bed furnace, particularly for burning partly dehydrated sludge, comprising a furnace housing having a bottom for supporting a fluidized bed, means for directing heated gases including combustion air upwardly from said bottom into the fluidized bed for maintaining said bed, said furnace having side walls extending upwardly from said bottom above said bed and defining a combustion chamber above said bed, a substantially horizontal furnace roof extending between said side walls defining a top of said combustion chamber and having at least one sludge charging opening therein for charging the sludge downwardly into said combustion chamber and also having a post combustion chamber opening, post combustion chamber wall means defining a post combustion chamber extending upwardly from said post combustion chamber opening and being substantially smaller in cross-section than the cross-section of said combustion chamber, and means for supplying secondary air into said post combustion chamber.

3,941,066
METHOD FOR DISPOSAL OF WASTE SYNTHETIC HIGH POLYMER

Hayami Itoh; Mamoru Yamada, and Yasuo Nozaki, all of Kobe, Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Mar. 3, 1972, Ser. No. 231,532
Claims priority, application Japan, Mar. 4, 1971, 46-12001
Int. Cl.² F23G 7/00
U.S. Cl. 110—18 R 2 Claims



1. A method for the disposal treatment of a waste synthetic high polymer at least part of which is fusible at temperatures below 500°C which comprises:

a. heating said waste synthetic high polymer at a temperature of from 200° to 500°C to thereby melt said fusible portion thereof,

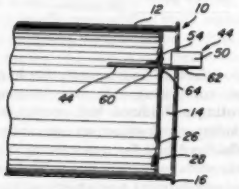
b. decomposing the remainder of said waste synthetic high polymer in a hot molten bath formed of said melted fusible portion thereof at a temperature of from 200° to 500°C; and

c. disposing of said hot molten bath, wherein at least a part of said hot molten bath is burned as fuel for heating the waste synthetic high polymer.

3,941,067
BAROMETRIC DRAFT REGULATOR

Nabil Y. Nicolas, Prescott, and Christian G. Schmelzle, Brockville, both of Canada, assignors to Selkirk Metalbestos, Brockville, Canada

Filed Oct. 16, 1974, Ser. No. 515,342
Int. Cl.² F23L 13/00; F23N 3/00
U.S. Cl. 110—163 12 Claims

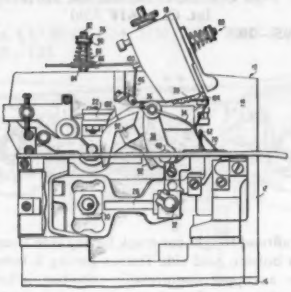


1. An automatic draft regulator comprising (a) a frame adapted to be mounted on the flue pipe of a fuel burning applicance; (b) an opening in the frame; (c) a gate pivotally mounted on hinges within the opening; (d) an opening in the gate; and (e) a substantially planar plate member pivotally connected to the gate and extending through the opening therein, said plate member being of substantially uniform thickness and acting as a weight means for balancing said gate.

3,941,068
THREAD CONTROL FOR OVEREDGE SEWING MACHINE

John M. Washburn, West Hartford, Conn., assignor to The Merrow Machine Company, Hartford, Conn.

Filed Dec. 12, 1974, Ser. No. 532,147
Int. Cl.² D05B 57/06
U.S. Cl. 112—162 7 Claims



1. In an overedge sewing machine including a frame, a thread-carrying needle, a needle arm supporting said needle for oscillatory movement in a first vertical plane extending in the direction of movement of work through the machine, a thread-carrying lower looper, a lower looper carrier supporting said lower looper for oscillatory movement in a second vertical plane extending at right angles to said first vertical plane, an upper looper, an upper looper carrier supporting said upper looper for recripocal and oscillatory movement along a line disposed in a third vertical plane extending parallel to said second vertical plane, means driving said needle arm and said lower and upper looper carriers to move said needle and said loopers in synchronization with one another to interloop the threads carried thereby to form an overedge seam, and first thread takeup means for controlling the thread carried by said lower looper, said first thread takeup means comprising spring biased thread tension means mounted on said frame, a plurality of stationary thread guides mounted on said frame, a first movable thread guide mounted on said lower looper carrier for oscillatory movement therewith, a second movable thread guide mounted on said upper looper carrier for oscillatory and reciprocal movement therewith, said first movable thread guide including means adapted to engage the thread carried by said lower looper during its oscillatory movement, said second movable thread guide including means movable in a path to engage a length of thread extending between two of the other of said thread guides during at least a portion of said oscillatory and reciprocal movement, said first and second movable thread guides cooperating with said tension means, said stationary thread guides, and said lower looper to control takeup of the lower looper thread.

3,941,069
AUTOMATIC METHOD AND APPARATUS FOR CLOSING THE TOE OF SEAMLESS HOSE

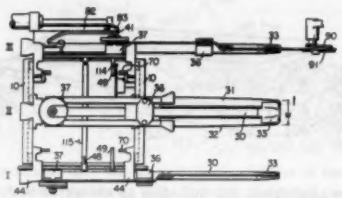
Yoshinobu Fukuyama, Kashiwara, Japan, assignor to Takatori Machinery Works, Ltd., Japan

Filed June 10, 1974, Ser. No. 477,824
Claims priority, application Japan, Dec. 28, 1973, 49-3466
Int. Cl.² D05B 19/00, 21/00
U.S. Cl. 112—262 10 Claims

9. A method of automatically closing the toe of seamless hose comprising the steps of

sucking a toe portion of a hose into a suction tube of a holding unit having finger pieces mounted adjacent the suction tube;

placing a welt portion of the hose over the suction tube and finger pieces;



thereafter moving the finger pieces laterally of the suction tube and outwardly of the suction tube to flatten the toe portion and carry the toe portion forward of the suction tube;

clamping the toe portion within a sewing machine and sewing the toe portion closed; and

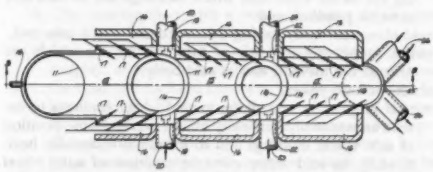
thereafter sucking the closed toe portion into the suction tube to draw the hose into and through the suction tube.

3,941,070

PRODUCT TRANSFER SYSTEM

Elton G. Kaminski, Sidney, Ohio, assignor to The Stolle Corporation, Sidney, Ohio

Filed Apr. 9, 1975, Ser. No. 566,294
Int. Cl.² B21D *43/18*
U.S. Cl. 113—7 A **13 Claims**



1. In an apparatus for manufacturing articles, such as two-piece can bodies, wherein a series of operations are performed on said articles at a first station, at least one intermediate station and a final station, a dimension of said article being reduced at said intermediate station; a channel connecting said stations, said channel at said intermediate station having fixed stop means of a dimension to prevent passage thereby of an article prior to the operation to be performed at such intermediate station, but to permit passage thereby after the operation at said intermediate station has been performed, and means for advancing the articles from station to station after each operation.

3,941,071

SHIFTING TWEEN DECK STRUCTURE FOR CARGO VESSELS

Ramon Zubiaga Aldecoa, Las Arenas-Guecho; Arturo Aldecoa Lacombe, Bilbao; Jose Maria Zubiaga Carles; Javier Arostegui Salaverri, both of Las Arenas-Guecho, and Damaso Urruticoechea Borde, Bilbao, all of Spain, assignors to Ascargo, S.A., Bilbao, Spain

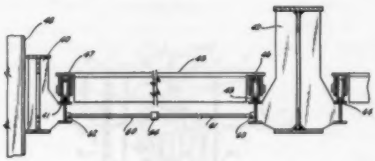
Continuation-in-part of Ser. No. 280,554, Aug. 14, 1972, abandoned. This application May 24, 1974, Ser. No. 472,949
Claims priority, application Spain, Feb. 2, 1972, 399411
Int. Cl.² B63B *25/18*
U.S. Cl. 114—72 **14 Claims**

1. A cargo vessel adapted to haul either bulk cargo or general cargo loaded on omnipallets, which comprises:

a cargo hold formed by the vessel's hull and by bulkheads placed transversely of said hull, said cargo hold having a hatch through which cargo is loaded and discharged:

a plurality of pairs of horizontal rails, the members of each pair of rails being secured at the same vertical level at opposite sides of said cargo hold and said pairs of rails being secured in vertically spaced relationship;

a plurality of parallel beams movably supported between said pairs of rails so as to span said cargo hold, means movably supporting said plurality of parallel beams for permitting said beams to be individually movable on said



rails and movable into a position below said hatch to receive cargo loaded on omnipallets and then horizontally movable into a storage position, and said means further permitting said beams to be optionally movable to positions at the sides of said cargo hold to convert the hold for bulk storage; and

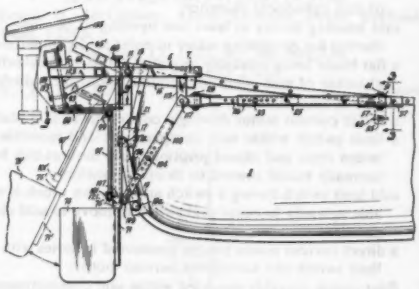
a plurality of omnipallets to carry said cargo, said omnipallets being positionable on a pair of said beams so as to be supported between said beams, at least some of said omnipallets being movable along said beams in a direction normal to the direction of movement of said beams.

3,941,072

STEERING SYSTEM FOR CANOES

Dolphus D. Caton, 149 Beebe Ave., and John R. Ralph, 180 College Part Drive, Apt. B-9, both of Elyria, Ohio 44035

Filed Feb. 11, 1975, Ser. No. 548,985
Int. Cl.² B63H *25/06*
U.S. Cl. 114—165 **10 Claims**



1. A steering system for a canoe comprising, in combination:

A. a first frame section for support across an end of the canoe,

B. a first pair of longitudinally adjustable brace members secured to the first frame section for engagement with the gunwales of the canoe,

C. a pivotally adjustable sling assembly secured at its upper portion to the first frame section for conforming engagement with the end edge of the canoe,

D. a second pair of longitudinally adjustable brace members connecting the lower portion of the sling assembly to the first frame section, and

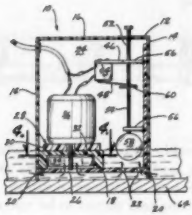
E. a second frame section pivotally connected to the first frame section for movement between an upper inoperative position and a lower operative position.

3,941,073

PORTABLE WATER BAILING DEVICE FOR A BOAT

Rex L. Ridgeway, 1301 S. D St., Fairfield, Iowa 52556

Filed Dec. 30, 1974, Ser. No. 537,333
Int. Cl.² F04B 49/04
U.S. Cl. 114—183 R 1 Claim



1. A portable water bailing device for a boat having a bottom wall and gunwales above said bottom wall, said device comprising:

a housing having sidewalls, a top wall and a bottom wall forming a compartment, said bottom wall being spaced upwardly from the lower edges of said sidewalls, said lower edges of said sidewalls being provided with a plurality of apertures therein positioned below said bottom wall;

a water pump mounted within said housing, said water pump having a cylindrical chamber therein with an inlet opening and an outlet opening, said outlet opening extending tangentially outwardly from the cylindrical wall of said cylindrical chamber;

said housing having at least one opening at the lower end thereof for permitting water to enter said compartment;

a flat blade being rotatably mounted within said cylindrical chamber of said pump for rotation about the cylindrical axis of said chamber;

a direct current motor drivingly connected to said blade;

a limit switch within said compartment and movable between open and closed positions, said limit switch being normally biased toward to its open position;

said limit switch having a switch arm thereon which is movable upwadly to cause said switch to move to said closed position;

a direct current power source connected in series with said limit switch and said direct current motor;

float means movably mounted within said compartment for vertical movement from a lower position to an upper position;

said float means comprising a vertically extending rod having a float on the lower end thereof and a flange positioned intermediate the ends thereof, the upper end of said rod extending through said top wall of said housing for grasping;

said limit switch arm being in engagement with said flange of said rod whereby said flange will move said switch arm upwardly to close said switch whenever said float moves to said upper position; and

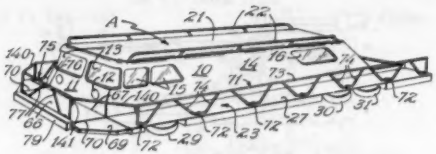
tube means connected to said outlet of said pump for directing water from said pump upwardly over said gunwales of said boat.

3,941,074

AMPHIBIOUS BUS

Paul A. Millerbernd, Winsted, Minn. 55395

Filed Apr. 5, 1974, Ser. No. 458,114
Int. Cl.² B60F 3/00
U.S. Cl. 115—1 A 6 Claims



1. An amphibious bus including an elongated body having an elongated watertight hull forming the bottom thereof,

a pair of wheel housings hingedly connected to opposite sides of said body,

said wheel housings being hingedly supported for movement between two extreme positions, the sides of the housings extending in a substantially vertical position in one said extreme position and extending in a substantially horizontal position in the other extreme position,

wheels for supporting said body,

means supporting said wheels within said wheel housings between said sides thereof, said wheels from said wheel housings to extend downwardly therefrom when said sides thereof are vertical and extending outwardly therefrom when said housing sides are horizontal,

means connected between said elongated body and said housings to move said wheel housings from one extreme position to the other,

means connected to at least certain of said wheels for driving the same when said wheel housings are in said one extreme position, and

said elongated body having a forward end and a rear end,

yokes supporting the pair of foremost wheels which are nearest the forward end of said body,

shafts on said yokes,

means supporting said shafts to said wheel supports to extend substantially vertically in said one extreme position of said wheel housings and to extend substantially horizontally in said other extreme position of said wheel housings,

means connected to said shafts for rotating the same in unison when said shafts are in a substantially vertical position,

a front platform, hinge means along an edge of said platform connecting said platform on a generally horizontal axis to the forward end of said body, said hinge means supporting said platform for movement between a substantially vertical position and a substantially horizontal position extending forwardly from said body.

3,941,075

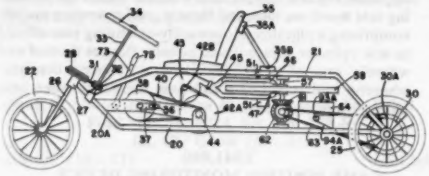
PEDAL POWERED AMPHIBIAN TRICYCLE WITH BLOWER-TURBINE COUPLING MEANS

Emanuel A. Rupenian, Lakeside Drive, Rockaway, N.J. 07866

Filed Mar. 12, 1975, Ser. No. 557,640
Int. Cl.² B60F 3/00
U.S. Cl. 115—2 20 Claims

1. In a pedal powered amphibian vehicle equipped with conventional brakes and having a single front wheel and two rear wheels from among only one is a driving wheel; the improvement comprising: a rotary air blower coupled to pedal crank arms and driven by them for creating a continuous pressurized air stream; a flat turbine wheel provided with reaction blade cavities and coupled to the rear driver wheel for turning it and thereby moving the vehicle; two nozzles connected to said air blower by a flexible double conduit and secured to a movable mounting means adjacent to the turbine

reaction blade cavities for directing a stream of air to the cavities to turn the turbine wheel; said movable mounting means including a transversely mounted rod for supporting



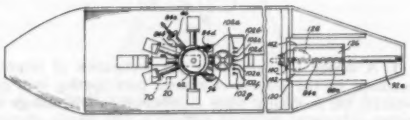
the nozzles as they are moved along a radius of the turbine wheel to vary the speed ratio between the pedal crank arms and the driver wheel.

3,941,076

OPERATING MEANS FOR BOATS

Robert D. Rice, 380 Murphy Creek Road, Grants Pass, Oreg. 97526

Filed Oct. 22, 1974, Ser. No. 516,981
Int. Cl.² B63H *11/08*
U.S. Cl. 115—12 R **9 Claims**



1. The combination with a boat, of power driving means therefor comprising, in combination,

a. a single water pump having a pump chamber located, roughly, at least, in the vicinity of the center of mass of the boat and its fixed contents, said pump having a vanel impeller rotatable about a fixed vertical axis and having the vanes thereof slanted always to drive water upward whenever the pump is in operation, said pump having a single casing formed with opposed intake and discharge passages,

b. a shell in which the pump casing is mounted for rotation about a generally vertical axis, said shell having numerous divergent passages running toward the front and rear ends of the boat and adapted for selective alignment with the intake and discharge passages of the pump casing,

one passage of the pump casing being wide enough to communicate simultaneously with more than one passage of the shell, but the other passage of the pump casing being so narrow that it can communicate with only one passage of the shell at a time, and

c. control means for manually rotating the pump casing relative to the shell,

the construction and arrangement being such that the operator through operation of said pump, and control of the pump impelled water through manipulation of the casing, has the option of driving the boat directly forward, backward or sidewise without substantial turning of the keel, or of steering the boat by turning the boat to right or left.

3,941,077

SIGNAL DEVICE FOR DETECTING FILTER CONDITION

Robert M. Moore, 4695 S. Jason St., Englewood, Colo. 80110

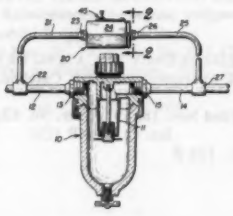
Filed Feb. 25, 1974, Ser. No. 445,210
Int. Cl.² G01L *9/12*
U.S. Cl. 116—70 **6 Claims**

1. A signal device for detecting the condition of a fluid line filter and for automatically giving a locked-in signal when the filter needs cleaning or replacement, comprising

a. a piston housing and a piston longitudinally movable in the housing, the piston normally being spaced from the inner surfaces of opposite ends of the housing, said piston having an annular groove between its ends,

b. a fluid line having a filter therein, and pressurized fluid intake and outlet lines communicating with the filter, said pressurized fluid passing through the filter,

c. a fluid line connecting the pressurized fluid intake line to one end of the piston housing and a fluid line connecting the pressurized fluid outlet line to the opposite end of the piston housing for permitting passage of fluid to opposite ends of the piston housing, and



d. signal means activated by fluid pressure in the piston housing when the piston has been moved toward one end of the housing by unbalanced pressure in the housing resulting from reduced volume of fluid passing through the filter, and

e. locking means for retaining the piston in the position in which the signal is activated, said locking means being responsive only to movement of the piston into signal giving position, said locking means comprising a spring metal plate fastened to the piston housing and a pin extending from the plate through the housing into contact with the groove in the piston preventing movement of the piston while in contact therewith.

3,941,078

IRRIGATION SIGNALLING DEVICE

Edward W. McCloskey, 439½ Riverside Drive, Burbank, Calif. 91506

Filed Sept. 13, 1974, Ser. No. 505,730
Int. Cl.² G01F *23/08*
U.S. Cl. 116—118 A **2 Claims**

1. An irrigation signalling device adapted to be installed in an irrigation ditch for signalling the presence of water therein, the combination of:

a. an elongated hollow body providing an elongated float chamber therein, said body being adapted to be installed in an irrigation ditch, and having a lower portion adapted to extend downwardly from the bottom of the ditch to form a well therebelow, and having an upwardly extending portion which extends upwardly from the lower part of said ditch;

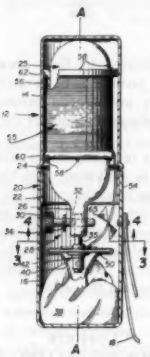
b. entrance opening means provided in said body and located near the lower portion of said ditch when said body is installed in the ditch for permitting irrigation water to enter the well of said float chamber of said body and selectively excluding foreign matter; and

c. a non-articulated elongated float is said body having a lower portion normally positioned in said well and an upper portion normally positioned in the upper part of said body, said float being adapted to move upwardly as a single element, and its upper end to extend a predetermined distance from the upper end of said body when water enters said float chamber, the projecting upper end of said float signalling the presence of water in said irrigation ditch.

3,941,079
EMERGENCY LOCATING DEVICE

John McNeill, Apartment 10, 210 S. Catalina, Pasadena, Calif. 91106

Filed Nov. 18, 1974, Ser. No. 524,712
Int. Cl.² B64B *1/50*
U.S. Cl. 116—124 B **5 Claims**



1. An emergency locating device comprising:

a pressure cylinder including an extended neck member having an outlet port disposed therein;

a lighter-than-air gas stored within said pressure cylinder;

a flow-control valve attached to said neck member to control the flow of said gas stored in said cylinder, said flow-control valve comprises:

a valve pin having a transverse passage positioned therethrough;

a stop means mounted to said valve pin to effect an axial alignment between said transverse passage of said valve pin and said outlet port in said neck member;

a valve extension member secured within said outlet port of said neck member and extending outwardly therefrom, said extension having a longitudinal passage communicating with said neck member outlet port, said extension having a transverse passage communicating with said longitudinal passage;

an inflatable buoyant means arranged to receive said lighter-than-air gas therein;

a self-closing valve means affixed to said inflatable buoyant means, self-closing valve means being removably attachable to said valve extension member, said valve means comprising:

a main body;

a chamber defined by said body; and

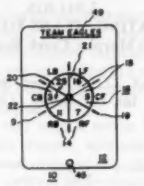
a valve piston operably disposed in said chamber, and having a central bore to receive said valve extention therein, and an outlet port, whereby gas flowing through said valve extension is permitted to flow therefrom into said inflatable buoyant means;

a reel operably supported by said pressure cylinder for rotation therein wherein said reel includes a spool having opposite annular flanges, and wherein means for mounting said spool are included therein, said mounting means; comprising a plurality of outwardly-extending pins affixed to said cylinder adjacent said annular flanges thereof and wherein one of said flanges has a reduced diameter whereby said tether line can pass thereover when said buoyant means is released.

3,941,080
GAME POSITION MONITORING DEVICE

Patricia M. Ford, R.D. No. 1, Croghan, N.Y. 13327

Filed June 22, 1973, Ser. No. 372,604
Int. Cl. G01d *13/04*
U.S. Cl. 116—130 **14 Claims**



1. A device for monitoring the occupation of respective positions by the players of a team participating in a game wherein the individual team members regularly change such positions, said device comprising:

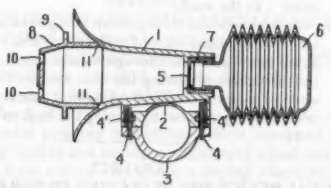
a. a carrying element comprising a number of first discrete spaces individually at which there can be provided information comprising one of respective ones of said positions and respective indicia identifying various ones of said team members and

b. a movable element rotatably mounted on said carrying element, said movable element comprising an identical said number of second spaces individually disposable opposite respective ones of said first spaces, said second spaces being respectively providable with information comprising the other one of said respective ones of said positions and said identifying indicia.

3,941,081
ALARM FOR A BICYCLE

Yoshihira Nakamura, Tokyo, Japan, assignor to Nakamura Sangyo Co., Ltd., Tokyo, Japan

Filed May 12, 1975, Ser. No. 576,290
Int. Cl.² G10K *9/02*, *9/04*
U.S. Cl. 116—142 FP **1 Claim**



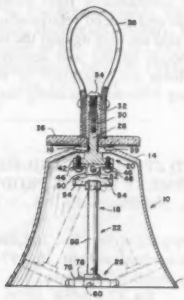
1. An alarm for a bicycle wherein a vocal member is fixedly encased inwardly of a base portion in a trumpet-like alarm cylindrical body integrally provided with a mounting piece to be secured to a handle or the like of the bicycle and a mounting piece receptacle bed for supporting said mounting piece

through screws and wherein a cover member of approximately inverted U-shaped in section, one end of which being closed and having a number of apertures formed in a pointed fashion, is adhered to a trumpet-like portion at the extremity of said cylindrical body which receives therein a bellows-like air blower bag through a guide cylinder.

3,941,082
HANDBELL

Jacob H. Malta, 207 Decatur St., Doylestown, Pa. 18901

Filed May 16, 1974, Ser. No. 470,467
Int. Cl.² G10K *1/06, 1/36*
U.S. Cl. 116—171 **6 Claims**

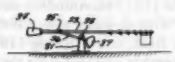


1. A handbell comprising in combination: a bell having a generally closed end; a clapper assembly removably carried within said bell centrally of the closed end thereof, said clapper assembly comprising a transversely extending, fixedly mounted pivot block; a clapper shaft having one end pivotally associated centrally of said block and including opposed surfaces sloping downwardly and away from said central pivot point, said shaft being adapted for pivotal swinging movements in one plane only with respect to said pivot block; individually adjustable, non-metallic limiting means each consisting of a generally flexible strip of resilient, polyurethane material carried by and positioned adjacent opposite ends of said pivot block, the ends of said strip positioned by said means for selectively engaging said sloping surfaces for yieldably opposing extreme pivotal, swinging movement of said clapper shaft in either direction thereof; and a clapper member carried by the free end of said clapper shaft and adapted to strike said bell during said extreme pivotal, swinging movements of said clapper shaft as adjustably opposed by said engagement with said limiting means.

3,941,083
FLAG POLE

Samuel F. Morse, c/o George Spector, and George Spector, both of 3615 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007

Filed Jan. 14, 1975, Ser. No. 540,829
Int. Cl.² G09F *17/00*
U.S. Cl. 116—173 **1 Claim**

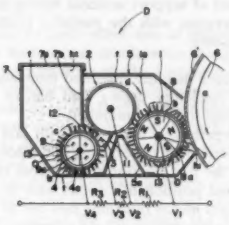


1. A flag pole assembly comprising a flag pole having an upper end with flag rings and a lower end with a counterweight, in combination with a pair of similar levers pivotally secured to each side of the pole by means of a pivot pin above said counterweight, each lever having a similar counter weight secured to the lower end thereof, including a pair of pivot pins each secured similarly to each of said levers, in further combination with a U-shaped base having a pair of spaced vertical flanges equi-spaced laterally from the first said counterweight, wherein said pair of spivot pins are aligned and mounted in said flanges and wherein the said second counterwights are equi-spaced from said flanges remote from the first said counterweight.

3,941,084
AUTOMATIC TONER SUPPLYING DEVICE

Takaji Kurita, Kawachinagano, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Nov. 26, 1974, Ser. No. 527,426
Claims priority, application Japan, Nov. 27, 1973, 48-133259
Int. Cl.² G03G *15/08*
U.S. Cl. 118—7 **6 Claims**



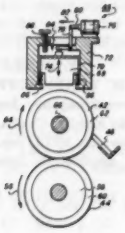
1. An automatic toner supplying device for use in an electrophotographic copying machine which comprises a developing roller rotatably disposed in a developer housing adjacent to a photoreceptor surface of a photoreceptor drum, through an opening formed in said developer housing, magnet means enclosed in a rotatable outer cylinder of said developing roller for formation of magnetic brush bristles of developing material consisting of carrier beads and toner particles on an outer periphery of said outer cylinder, said magnetic brush bristles being adapted to rub against a latent image formed portion on said photoreceptor surface for developing said latent image into a visible toner powder image, a toner supply roller with which carrier beads are adhered rotatably disposed at a lower portion of a toner supply tank incorporated in said developer housing and on which magnetic brush bristles are also formed through magnet means enclosed in said toner supply roller, an offset drum of electrically conductive material rotatably disposed between said developing roller and said toner supply roller for transferring toner particles on said brush bristles of said toner supply roller onto said brush bristles of said developing roller and an electrical control circuit connected to said developing roller, said toner supplying roller and said offset drum, said toner particles consumed for said development being proportional, in amount thereof, to potential variations of said brush bristles which contact said photoreceptor surface during rotation of said photoreceptor drum and said developing roller, said potential variations being utilized as a toner replenishing signal for applying a bias voltage corresponding to said toner replenishing signal, through said control circuit, to said brush bristles formed on said toner supply roller, which brush bristles are adapted to supply, through said offset drum, an amount of toner particles approximately equal to said amount of said toner particles consumed for said developing, to said brush bristles of said developing roller.

3,941,085

RELEASE MATERIAL APPLICATOR

Louis R. Hattler, Marion, and Ari Bar-on, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 19, 1975, Ser. No. 551,214
Int. Cl.² G03G *15/20*
U.S. Cl. 118—60 10 Claims



1. An apparatus for applying release material to a heated fuser member in communication with a back-up member wherein a sheet of support material having particles thereon passes therebetween with the particles contacting the fuser member, including:

a frame;

a bar of release material mounted movably in said frame;

means for resiliently urging said bar to a first position spaced from the fuser member;

a solenoid operatively associated with said bar; and

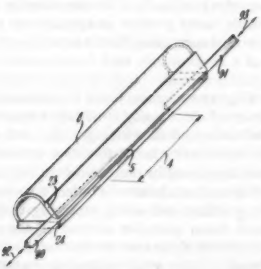
means for periodically energizing said solenoid to move said bar from the first position spaced from the fuser member to a second position in contact with the fuser member, said resilient means returning said bar to the first position upon the energization of said solenoid.

3,941,086

FLUID DOCTOR BLADE

Riccardo Roncan, Genoa, Italy, assignor to Italsider S.p.A., Genoa, Italy

Continuation of Ser. No. 386,813, Aug. 8, 1973, abandoned, which is a continuation-in-part of Ser. No. 144,186, May 17, 1971, Pat. No. 3,753,418. This application Oct. 23, 1974, Ser. No. 517,132
Int. Cl.² B05C *11/06*
U.S. Cl. 118—63 3 Claims



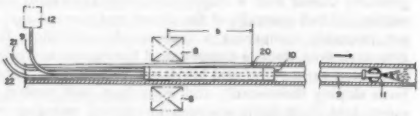
1. An improved device for the continuous adjustment of the zinc coating on a metal strip coming from a molten zinc bath at controlled temperature, of the type comprising a pair of horizontal manifolds arranged for positioning just above the bath surface on both sides of the metal strip, said manifolds each comprising an elongated nozzle, each of said manifolds being supported by a pair of pivotally mounted feed conduits which communicate with the ends of said each manifold, means to simultaneously adjust the pair of nozzles with respect to angular relationships and the distance therebetween, each said nozzle comprising a pair of elongated lip members defining therebetween slot means for directing a stream of gases from said elongated nozzle to impinge on the sides of the metal strips, wherein the lower lip, near its base, is fastened to said manifold and is provided on its lower face with a slot parallel to said elongated nozzle, characterized in that said lower lip comprises deformable means for varying the longitudinal profile of said slot means, a plurality of pulling and pushing means for deforming said deformable means arranged at selected distances under said lower face and parallel slot and a plurality of remote control means singularly acting on said pulling and pushing means, connecting means between said remote control means and said pulling and pushing means, and two substantially rigid elongated side shutters arranged in end to end spaced relationship inside said nozzle, means mounting said shutters against the inner surfaces of said lips for simultaneous sliding and sealing contact therewith while said manifolds are operative or inoperative for thus minimizing coating deformations along the edges of the strip.

3,941,087

RESIN COATED STEEL PIPE AND THE PROCESS AND EQUIPMENT FOR ITS PRODUCTION

Yoshimi Yazaki, Nakamaru-cho No. 9-3, Itabashi, Tokyo, Japan

Continuation-in-part of Ser. No. 280,084, Aug. 14, 1972, abandoned. This application Sept. 30, 1974, Ser. No. 510,640
Claims priority, application Japan, Aug. 12, 1971, 46-61505
Int. Cl.² B05B *13/06*
U.S. Cl. 118—306 8 Claims



1. A device for coating the inner surface of a welded seamed steel pipe during its manufacture, comprising

a gun-pipe (**9**) having an elongated pipe portion, a nozzle portion (**11**) at one end of said pipe portion and a tube at the opposite end of said pipe portion, said tube being adapted to be connected to a source of paint (**12**);

an elongated ferromagnetic member having a hollow bore (**101**), said hollow bore surrounding a portion of said pipe portion with an inner space therebetween to permit the flow of cooling fluid between said pipe portion and said ferromagnetic member;

a pipe holder (**104**) having an inflow port and an outflow port, an inlet pipe (**21**) connected to said inflow port to supply cooling fluid and connected to a source of cooling fluid, an outlet pipe (**22**) connected to said outflow port to remove the heated cooling fluid;

a ported pipe (**103,1031**) having a port (**1031**), a slide sleeve (**106**) connected to said ported pipe, said slide sleeve (**106**) being slidably movable on said gun-pipe pipe portion which protrudes therethrough, a cap member (**10**), an enclosing electrically insulative casing pipe (**105**) closed by said cap member (**10**) at one end and closed by said pipe holder (**104**) at the opposite end, said casing pipe (**105**) surrounding said ferromagnetic member (**101**) with an outer space therebetween for the flow of cooling fluid, and a spring (**108**) positioned between said cap member and said slide sleeve to exert pressure on said slide sleeve (**106**) and through said ported pipe on said ferromagnetic member,

a high frequency induction coil (**8**) for welding said seamed steel pipe, said coil being connected to a source of high frequency alternating current and positioned outside of

and proximate to said electrically insulative casing pipe (105),

wherein said inflow port is in fluid communication with the outer space between said casing pipe and said pipe portion and said outflow port is in fluid communication with the inner space between said ferromagnetic member and said gun-pipe pipe portion and wherein the gun-pipe protrudes through said cap so that its nozzle portion is within that portion of said steel pipe which has been seamed.

3,941,088

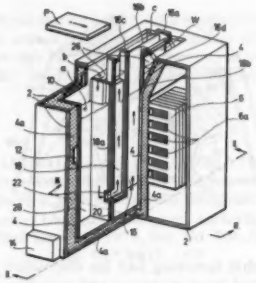
STANDING WAVE METALLIZING APPARATUS FOR COATING A SUBSTRATE WITH MOLTEN METAL

Arnold Rónaföldi, and István Zoltán, both of Miskolc, Hungary, assignors to Csongradmengyei Tanacs Vegyesiparm Szolgaltato Vallalat, Hodmezovasarhely, Hungary

Continuation-in-part of Ser. No. 302,563, Oct. 31, 1972, abandoned. This application July 15, 1974, Ser. No. 488,570

Int. Cl.² B05C *3/12*

U.S. Cl. 118—620 **7 Claims**



1. A standing-wave metallizing apparatus for coating a substrate with a molten metal of a melting point lower than that of the material of the substrate, comprising; a tank, a bath for the molten metal; pump means outside said tank for heating the metal and for keeping it in circulatory motion to and from said bath; said pump means including a magnetic circuit and a laminated iron core also outside said tank, with an air gap in said core; and means in said tank including a working channel and an auxiliary channel for producing laminar flow of the molten metal in at least a portion of said pump means said channels being in part defined by ferromagnetic covers, said air gap including said covers, said working channel and in part said auxiliary channel, at least part of said channels and the laminar flow toward a top level of the molten metal, resulting in a standing-wave pattern above the top level, by the aid of which pattern the substrate is coated with the molten metal at the top level, without immersing the substrate in the molten metal.

3,941,089

COLLECTOR FOR IMAGOS AND THE EGGS THEREOF

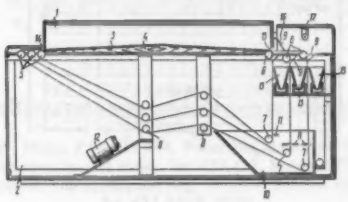
Sergei Vasilievich Andreev, Leningrad; Mikhail Grigorievich Leibenzon, Moskovskoi Oblasti; Jury Petrovich Trushin, Moscow, and Mikhail Sergeevich Luzgin, Leningrad, all of U.S.S.R.

Continuation of Ser. No. 323,402, Jan. 15, 1973, abandoned. This application Oct. 25, 1973, Ser. No. 409,450

Int. Cl. A01k *29/00*

U.S. Cl. 119—1 **2 Claims**

1. A collector for imagos and the eggs thereof comprising means defining a chamber and an auxiliary compartment located below said chamber; said chamber having a bottom and inlet means at one end for admitting imagos thereinto; a plurality of screens and a support for said screens adapted for the imagos to lay eggs thereon; said screens and supports being in the form of an endless conveyor adapted to move across said chamber bottom and through said auxiliary compartment by means of a drive shaft for each said screen and support located in said auxiliary compartment and at the end of said chamber opposite said one end, and a driven shaft for each said screen and support located in said auxiliary compartment and at said one end of said chamber; a plurality of rotary brushes located in said auxiliary compartment in proximity to said drive shafts for removing said eggs from said screens and support; a plurality of containers located below said brushes for catching said eggs; said drive shafts being



arranged parallel to each other and at different levels with respect to said bottom and said brushes being located in between and behind said drive shafts; a washing bath located in said auxiliary compartment for cleaning said screens and support after said eggs are removed therefrom, said screens and support being arranged to pass through said bath after passing over said drive shafts and past said brushes; a plurality of brushes located in said bath to scrub said screens and support; a heater fan located in said auxiliary compartment for drying said screens and support after they emerge from said bath; tensioning means for equalizing the tension of said screens and support; and means for driving said drive shafts.

3,941,090

CEDAR-BASED ANIMAL LITTER

Raymond J. Fry, Concord, Calif., assignor to The Clorox Company, Oakland, Calif.

Filed Oct. 10, 1974, Ser. No. 513,559

Int. Cl.² A01K *29/00*

U.S. Cl. 119—1 **8 Claims**

1. A composition comprising an adherent mass of cedar particles, an alfalfa binder, and water.

3,941,091

EGG LAYER SYSTEM

Roger L. Fleshman, 204 Cypress Circle, Broomfield, Colo. 80020

Continuation-in-part of Ser. No. 396,292, Sept. 11, 1973, Pat. No. 3,867,903. This application Mar. 7, 1974, Ser. No. 448,840

Int. Cl.² A01K *31/00*

U.S. Cl. 119—18 **8 Claims**

1. A cage system for the production of poultry comprising:

a. an elongated, enclosed building having a roof, side walls and end walls,

b. a plurality of vertical support columns within said building to support the roof, said support columns being positioned equally spaced transversely and longitudinally within said building to form a plurality of longitudinal rows and aisles of equal width between said rows extending substantially the length of said building,

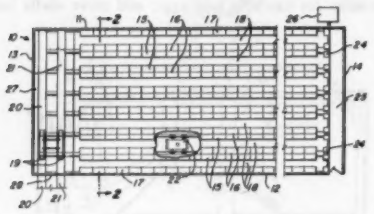
c. a plurality of longitudinal rows of tiered cages suspended from said columns so as to face each of said aisles,

d. a pair of parallel rails disposed longitudinally along the length of each of said aisles, the rails of each pair being arranged along the sides of said aisles and attached to said

columns, the dimension between the rails of each pair being the same,

e. carriage means arranged to ride along said rails whereby said carriage means can be moved along the full length of each aisle to service the cages facing the aisles,

f. two open floor areas arranged at opposite ends of the building and adjacent to the ends of said aisles, said floor areas including guide means centrally located at the end of each aisle for receiving said carriage means and guiding the carriage means so as to direct it into another aisle



whereby the carriage means will follow a continuous closed-loop path to service all of the rows of tiered cages,

g. power drive means mounted on said carriage means and arranged for moving the carriage means continuously in a single direction along each of said aisles to follow said closed-loop path, and

h. control means for controlling the movement of said carriage means whereby the cages can be serviced on a predetermined timed cycle so as to perform the necessary services such as feeding, egg collecting and cleaning of the cages.

3,941,092

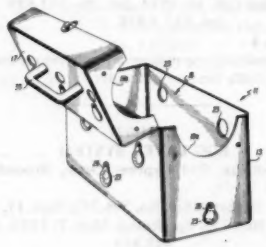
PET SANITIZER

Paul A. Winters, 2609 Clark Road, Tampa, Fla. 33618

Filed Dec. 5, 1974, Ser. No. 529,952

Int. Cl.² A01K *29/00*

U.S. Cl. 119—19 **2 Claims**



1. A multipurpose animal care unit for transporting bathing, rinsing, and fumigating an animal, comprising:

a. an open-top container including a rigid wall defining the container periphery, said container receiving the body of the animal;

b. a cover adapted for mounting on said container to open and close the open top of said container;

c. a pair of opposed recesses formed respectively in said container and said cover, whereby when said cover is in its closed position, said recesses mate to form a passage for receiving the neck of the animal and allowing its head to remain outside of said container;

d. said cover having at least one orifice and said container wall having a plurality of orifices disposed in spaced relationship throughout the entire container periphery so as to provide direct access to all body portions of the animal;

e. means for selectively opening and closing said orifices comprising a corresponding plurality of displaceable closures, respective ones of closures connected with the exterior wall of said container proximate said orifices; and

f. said container wall having a drain opening proximate the bottom of said container, whereby a fluid may be directed into said container through selective ones of said orifices to treat body portions of the animal adjacent said selective orifices.

3,941,093

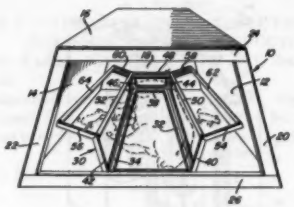
PORTABLE FARROWING BED

Albert H. Sievers, and Isabelle R. Sievers, both of R.R. No. 1, Fieldon, Ill. 62031

Filed Sept. 19, 1974, Ser. No. 507,615

Int. Cl.² A01K *1/02*

U.S. Cl. 119—20 **7 Claims**



1. A portable farrowing bed for disposition within a hog house, said bed being elongated and including a first pair of opposite side longitudinal members rigidly interconnected at corresponding opposite ends and adapted to rest upon the floor of a hog house, a second pair of opposite side longitudinal members generally paralleling and rigidly supported at their opposite ends from said first pair of longitudinal members at a first elevation thereabove and with said second pair of members spaced slightly outwardly of remote sides of vertical planes containing said first pair of members, and a third pair of longitudinal members supported at their opposite ends from said first pair of members in positions spaced outwardly of remote sides of said second pair of members, said third pair of members being adapted to abut, along their remote sides, the opposing inner surfaces of the side walls of a hog house in which said bed is disposed, a horizontal transverse member extending and secured between one pair of corresponding ends of said second longitudinal members.

3,941,094

WATERER VALVE ACTUATOR-FLOAT

Norman P. Nilsen, Jr., P.O. Box 33, Phelan, Calif. 92371

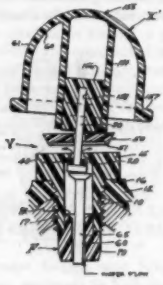
Filed Dec. 15, 1971, Ser. No. 208,270

Int. Cl.² A01K *7/02*

U.S. Cl. 119—80 **1 Claim**

1. A waterer unit responsive to the level of water dispensed therein from a pressured supply thereof and comprising, an upwardly open vessel having a side wall of substantial vertical extent for the containment of a water level therein, a valve body with a chamber therethrough opening into the water supply and into the vessel, a downwardly faced valve seat in said chamber surrounding the opening thereof into the vessel, a shut-off valve with an axially and angularly displaceable pin projecting freely through said seat and said valve normally engaging the valve seat and operable therefrom by axial as well as by angular displacements so as to increase the water level in said vessel, and an actuator-float affixed to the said

valve pin within the confines of the vessel side wall and comprising a hollowed downwardly open body adapted to entrap air and operable by floatation to lift and close the shut-off valve when the water level rises therein and with a tubular extension projecting centrally thereof and attached to and



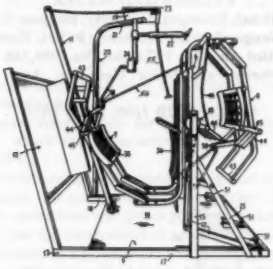
closed by a head carried by the valve pin forming a floatation chamber and with a flange at the perimeter of the hollowed body and operable through engagement by axial as well as by lateral-angular displacement to increase the water level therein.

3,941,095

ANIMAL HANDLING APPARATUS

Ian Robert Hamilton, Illabo, and David Murray Underwood Alley, Bethungra, both of Australia, assignors to Fire Fighting Enterprises Limited, Ermington, Australia

Filed Sept. 16, 1974, Ser. No. 506,324
Int. Cl.[2] A61D *3/00*
U.S. Cl. 119—103 **11 Claims**



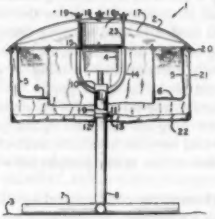
1. An animal handling apparatus having an animal receiving station, operating station, and release station comprising
means for trapping and holding an animal in the receiving station, and
means for inverting the animal and transferring it toward an operating station, maintaining it in the operating station while another animal is trapped and held in the receiving station, and transferring it toward the release station while the other animal is inverted and transferred toward the operating station including
a base frame having
means for providing a substantially horizontal axis,
rotatable frame means mounted on said axis,
a plurality of said trapping and holding means fixed to said rotatable frame means for movement therewith, and
means for locking said rotatable frame means so that each of said trapping and holding means may be temporatily fixed in the receiving station and the operating station comprising
disc means mounted for simultaneous rotation with said rotatable frame and having
detent means located about the periphery thereof, equal in number to the number of said trapping and holding means,
latch means pivotally mounted on said base frame adjacent the periphery of said disc means for selective engagement with said detent means, and
linkage means, actuatable by an operator of the apparatus, connected to said latch means for selective disengagement of said latch means from said disc means to allow rotation of said rotatable frame.

3,941,096

COMBINATION INSECTICIDE APPLICATOR AND FEEDER

Fred W. Mann, P.O. Box 444, Waterville, Kans. 66548

Continuation-in-part of Ser. No. 452,422, March 18, 1974, abandoned. This application Aug. 19, 1974, Ser. No. 498,744
Int. Cl.[2] A01K *29/00*
U.S. Cl. 119—159 **19 Claims**



1. A combination insecticide applicator and feeder for livestock comprising:
a. a support structure having an upright member;
b. a hood;
c. means on said hood and on said upright member to support said hood at a selected position above a ground surface;
d. a container having insecticide material therein supported by said support structure adjacent to and below said hood, said container having a bottom portion thereof adopted to dispense insecticide material onto livestock in response to engagement of a bottom portion thereof by the livestock;
e. holding means supported on said upright member and positioned below said hood for supporting a livestock attracting material in spaced relation to said container;
f. means for retaining said holding means at a selected position having a lower surface of the livestock attracting material positioned above said bottom portion of said container whereby livestock must engage said bottom portion of said container to have access to the livestock attracting material; and
g. a shield depending from said hood and positioned to protect the bottom portion of said container from weather.

3,941,097

ROTARY COMBUSTION ENGINE HAVING IMPROVED IGNITION MEANS

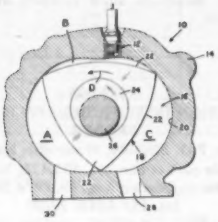
Theo Seufer, Neckarsulm, and Richard van Basshuysen, Bad Wimpfen, both of Germany, assignors to Audi NSU Auto Union Aktiengesellschaft, Neckarsulm and Wankel GmbH, Lindau, Bodensee, both of, Germany

Filed May 30, 1974, Ser. No. 474,668

Claims priority, application Germany, June 9, 1973, 2329686

Int. Cl.² F02B *53/12*

U.S. Cl. 123—8.09 **6 Claims**



1. In a rotary internal combustion engine of the type having a housing with a peripheral inner wall surface defining a multilobe cavity and in which a rotor is eccentrically supported for planetary rotation and wherein said rotor periphery defines with the housing a plurality of working chambers which expand and contract in volumetric size as the rotor rotates, an improved ignition device in said housing comprising:

a. a spark plug having an elongated electrode means disposed centrally thereof and forming at one end of the spark plug one part of a spark-gap;

b. support means in the housing for receiving and supporting said spark plug so that said spark-gap end portion defines with said support means an ante-chamber in close spaced relation to the inner peripheral wall of the housing; and

c. an ignition channel for communicating the ante-chamber with successive working chambers;

d. said channel being of small size relative to the size of the ante-chamber and disposed with its longitudinal axis in offset relationship with the electrode means in a direction counter to the direction of rotor rotation and extending substantially parallel to the longitudinal axis of the central elongated electrode means.

3,941,098

ROTARY ENGINE WITH FUEL SUPPLY THROUGH ROTOR

Thomas C. Roberts, Ridgewood, N.J., assignor to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Filed Mar. 31, 1975, Ser. No. 563,641

Int. Cl.² F02B *53/02*

U.S. Cl. 123—8.13 **7 Claims**

1. A rotary combustion engine comprising:

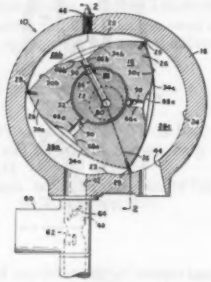
a. an outer body having an internal cavity, the peripheral surface of which has a multilobe profile and also having an air intake port and a combustion gas exhaust port,

b. a shaft coaxial with said cavity and having a cylindrical eccentric portion disposed within said cavity,

c. an inner body of generally polygonal profile and journaled on said eccentric portion for rotation within said outer body relative to said outer body and shaft, the apex portions of said inner body having sealing cooperation with said peripheral surface to define a plurality of working chambers which vary in volume in response to relative rotation of said inner and outer bodies with each peripheral surface portion of said inner body extending between adjacent apex portions forming a working face for the adjacent working chamber,

d. first passage means for supplying a relatively lean fuel-air mixture to said working chambers through said intake port,

e. second passage means for supplying a relatively fuel-rich charge to each working chamber after the lean mixture therein has been substantially compressed, said second



passage means including individual passages in the inner body, one for each working chamber, with each of said individual passages having its downstream end terminating at the working face of its associated working chamber, and

f. ignition means for initiating combustion in each working chamber in the region of said chamber containing said relatively rich charge.

3,941,099

STEAM GENERATOR ASSEMBLY FOR PRESSURIZED WATER REACTORS WITH A STRAIGHT TUBE BUNDLE AND A PARTIAL FLOW PREHEATER TRAVERSIBLE BY PRESSURIZED WATER

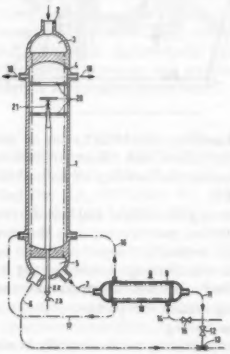
Rupprecht Michel, Erlangen, Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Filed Aug. 26, 1974, Ser. No. 500,346

Claims priority, application Germany, Aug. 29, 1973, 2343576

Int. Cl.² F22B *1/06*; F22D *7/00*

U.S. Cl. 122—32 **3 Claims**



1. Steam generator assembly for pressurized water reactors having a housing surrounding a straight tube bundle traversible by pressurized water and connected to a pressurized water inlet chamber and a pressurized water outlet chamber, respec-

tively, at opposite ends thereof, the housing having an inlet and an outlet for feedwater flowing into and out of the housing over the tube bundle and being vaporized and slightly superheated in a single pass therethrough, comprising two pressurized water outlet lines of relatively smaller and larger diameter, respectively, extending from the outlet chamber, a partial flow preheater for the feedwater heatable by pressurized water connected to the outlet line of relatively smaller diameter, said partial flow preheater having a pressurized water outlet line, and a control valve connected in said pressurized water outlet line of said partial flow preheater for controlling the pressurized water flow through said partial flow preheater so as to effect maximal preheating of feedwater therein up to substantially vaporization temperature thereof.

3,941,100
APPARATUS FOR PRODUCING AN ENGINE-SPEED SIGNAL FOR AN ELECTRONIC FUEL INJECTION SYSTEM

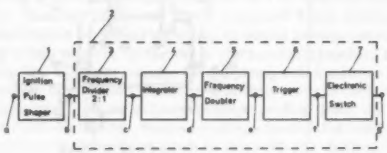
Gotthard Bensch; Gustav Ehrich, and Peter Fendler, all of Wolfsburg, Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed Apr. 4, 1974, Ser. No. 458,053

Claims priority, application Germany, June 1, 1973, 2327801

Int. Cl.² F02B 3/00

U.S. Cl. 123—32 EA **2 Claims**



1. An electronically controlled fuel injection system comprising, in combination:

a. signal generating means for producing a first train of pulses in which the pulse intervals are dependent upon engine RPM;

b. signal processing means, connected to said signal generating means, for producing a second train of pulses in which the pulse intervals are dependent, at least approximately, upon the mean value of pulse intervals in said first pulse train within a given pulse sequence, thereby at least reducing pulse interval changes of short duration, said signal processing means including:

1. pulse frequency divider means connected to said signal generating means;

2. integrator means connected to said pulse frequency divider means;

3. pulse frequency multiplier means connected to said integrator means, said pulse frequency divider means and said pulse frequency multiplier means having the same factor of division and multiplication, respectively, so that the output of said pulse frequency multiplier means exhibits approximately the same pulse frequency as said first pulse train; and

4. trigger means, connected to said pulse frequency multiplier means, for producing an output signal whenever the input thereto reaches a prescribed value; and

c. fuel injection means, connected to said signal processing means, for injecting fuel into an internal combustion engine upon receipt of said pulses of said second pulse train.

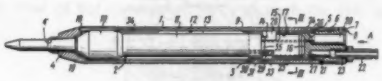
3,941,101
IMPACT ACTION MECHANISM

Alexandr Dmitrievich Kostylev, ulitsa Derzhavina, 19, kv. 44; Konstantin Stepanovich Gurkov, ulitsa Derzhavina, 18, kv. 13; Konstantin Konstantinovich Tupitsyn, ulitsa Krylova, 3, kv. 37, and Vladimir Isankovich Kreimer, ulitsa Voskhod 7, kv. 73, all of Novosibirsk, U.S.S.R.

Filed Dec. 28, 1973, Ser. No. 429,369

Int. Cl.² F02B 71/00

U.S. Cl. 123—46 H **4 Claims**



1. An impact action device comprising: a hollow housing; a sleeve having an internally provided space open at one end and a thickened bottom portion, said sleeve having an external lateral surface and being accommodated in an internal space of said housing and operatively coupled to said housing so that the bottom portion of said sleeve defines the end face of said housing; an impact member reciprocably movable through working strokes and return strokes and having an enlarged front portion and a tail portion, mounted in the internal space of said housing so that said enlarged front portion thereof defines with the front part of said housing a buffer chamber for driving said impact member through said return strokes, while said tail portion of said impact member defines with said housing an annular gap and is receivable in the space of said sleeve; a closed combustion chamber defined in said sleeve by additional introduction of the tail portion of said impact member into the internal space of said sleeve; a first passageway formed in the bottom portion of said sleeve and communicating with said combustion chamber, said passageway being open in the end face of said housing for supply of a combustible matter into said combustion chamber to propel said impact member through the working strokes thereof by combustion of said combustible matter; a second passageway formed in the bottom portion of said sleeve and communicating with said combustion chamber, said second passageway being open in the end face of said housing for communication with ambient atmosphere, to provide for exhaust of the products of combustion from said combustion chamber; a plurality of ports provided in said sleeve and communicating with the internal space thereof, said ports being periodically closed off by said tail portion of said impact member during return strokes thereof; a plurality of grooves formed in the external lateral surface of said sleeve and registering with respective ones of said plurality of ports at one end of said grooves, said groves communicating at the respective opposite ends thereof with the respective ones of said first and second passageways, to establish communication of said first and second passageways with said combustion chamber, respectively, to supply said combustible matter thereinto and to exhaust said combustion products therefrom whereby the periodical closing off by said tail portion of said ports separates said combustion chamber from said first and second passageways, during combustion of said combustible matter therein to effect working strokes of said impact member and subsequent exhaust of said combustion products.

3,941,102
BUCKET TAPPETS

Eric Gordon Bareham, Rednal, England, assignor to British Leyland UK Limited, London, England

Filed Aug. 16, 1974, Ser. No. 498,248

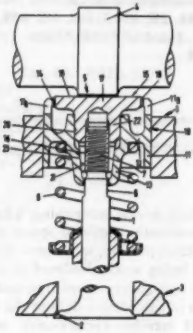
Int. Cl.² F01L 1/14

U.S. Cl. 123—90.52 **5 Claims**

1. A poppet valve assembly for an internal combustion engine, having a poppet valve urged against a valve seat by a valve return spring and featuring:

a. a tappet foot in screw thread engagement with the end of the valve stem and having locking formations; and

b. a retainer collar non-rotatably engaged on a non-round section of the valve stem and having locking formations which inter-engage those of the tappet foot and which



afford a plurality of alternative angular settings for the foot;

the retainer collar being displaceable against the valve return spring in order to disengage it from the foot for adjustment of the valve operating clearance.

3,941,103

METHOD AND APPARATUS FOR CHANGING THE SPARK ADVANCE OF INTERNAL COMBUSTION ENGINES

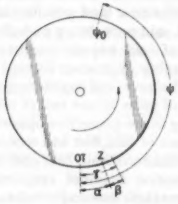
Gunter Hartig, Hansastrasse 29, Karlsruhe 21, Germany (D-7500)

Filed Mar. 25, 1974, Ser. No. 454,545

Claims priority, application Switzerland, July 26, 1973, 10936/73

Int. Cl.² H03K *3/00*

U.S. Cl. 123—117 R **28 Claims**



1. A method of changing the spark advance characteristic of internal combustion engines, in which pulse sequences are produced, the main pulses of which are all of equal length and derived from a rotating part of the internal combustion engine, including the steps of counting the number of such pulses occurring during a pre-determined time t (reference count) this representing a desired angle of spark advance α relative to engine top dead centre, and is dependent on the speed of the internal combustion engine, deducting said count from a larger angle ψ count (reference angle) which extends between said top dead centre and an arbitrary phase position ψ 0 in advance thereof, said angle ψ being represented by a predetermined number of pulses which is independent of the engine speed, starting a pulse count (trigger count) from said position ϕ 0, and generating an ignition pulse during said trigger count when the number of pulses counted from the arbitrary phase position ψ 0 corresponds to the differential angle $\psi - \alpha$, so that the ignition pulse occurs advanced by the advance angle α relatively to the engine top dead centre, wherein the dependence of the advance angle α on the speed of rotation of the internal combustion engine changes in that the number of pulses (final number) corresponding to the effective advance angle is obtained from the number of pulses which appear during the pre-determined time t (starting number) amended by at least one calculating operation applied to said starting number, said calculating operation depending on a parameter of said engine operation.

3,941,104

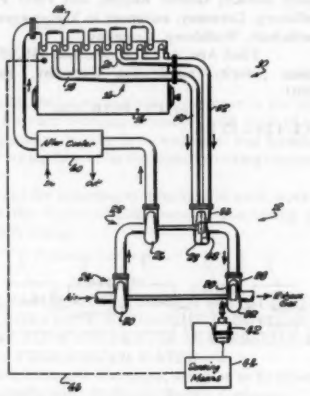
MULTIPLE TURBOCHARGER APPARATUS AND SYSTEM

Hans Egli, Santa Monica, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed July 1, 1974, Ser. No. 484,891

Int. Cl.² F02B *33/36, 29/04*

U.S. Cl. 123—119 CB **12 Claims**



1. Turbocharger apparatus comprising:

a. first and second turbochargers having respective first and second turbines drivingly coupled to respective first and second compressors,

said first and second turbines having respective first and second fluid distributors arranged to admit fluid to respective first and second rotors of said turbines,

said first distributor being characterized as a vaneless scroll housing enclosing said first rotor of said first turbine and having meridional wall means disposed therein extending from adjacent the entrance of said housing to substantially adjacent said first rotor,

said second distributor being characterized as a vaneless scroll housing enclosing said second rotor of said second turbine,

said second turbine including vane means adjustably disposed adjacent the fluid entrance of said vaneless scroll housing of said second fluid distributor and arranged to vary the fluid flow therein without substantial loss of total energy of the fluid over a predetermined operating range of said second turbine;

b. fluid conduit means coupling the exhaust of said first turbines to the inlet of said second turbine and the discharge of one of said compressors to the intake of the other of said compressors and

c. an internal combustion engine having intake and exhaust manifold means, with the discharge of said first compressor coupled to said intake manifold means,

said exhaust manifold means providing a coupling between one group of engine cylinders and one portion of said distributor defined by one surface of said meridio-

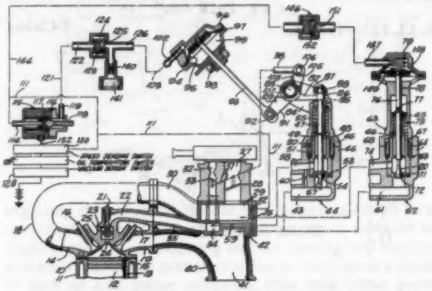
nal wall means, and providing a coupling between another group of engine cylinders and another portion of said first distributor defined by another surface of said meridional wall means.

3,941,105

EXHAUST GAS RECIRCULATION FOR THREE-VALVE ENGINE

Shizuo Yagi, Asaka, and Urataro Asaka, Kamifukuoka, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 8, 1973, Ser. No. 413,969
Int. Cl.² F02M *25/06*
U.S. Cl. 123—119 A **17 Claims**



1. In an internal-combustion spark-ignition piston engine having a main combustion chamber and an auxiliary combustion chamber connected by a restricted torch nozzle, the combination of: means including an intake passage for supplying a lean mixture to the main combustion chamber, means including an intake passage for supplying a rich mixture to the auxiliary combustion chamber, a throttle valve in each of said intake passages, an exhaust passage leading from the main combustion chamber, means forming a conduit for conducting a portion of the exhaust gases to mix with rich mixture in the intake passage to the auxiliary combustion chamber, a control valve for controlling flow of exhaust gases through said conduit, means for operating said valve including a throttle member connected to operate said throttle valves, means including resilient means whereby said throttle member may act to open said control valve, and means responsive to vacuum pressure in one of said intake passages for modifying the operation of said control valve.

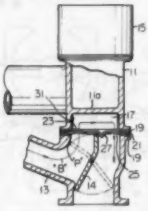
3,941,106

ARRANGEMENT FOR HEATING THE SUCTION GASES OF AN INTERNAL COMBUSTION ENGINE

Nobuyuki Kobayashi, and Masahiko Nakada, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Dec. 12, 1973, Ser. No. 424,085
Claims priority, application Japan, Aug. 25, 1973, 48-94838
Int. Cl.² F02M *31/00*
U.S. Cl. 123—122 AC **5 Claims**

1. A heater for incoming fuel-air mixture to an internal combustion engine of the type that includes an intake manifold for said mixture having a bottom floor area; a plurality of heat conducting fins extending downward from the exterior wall of the intake manifold in the bottom floor area; an exhaust manifold disposed underneath the intake manifold adjacent to the finned area for conveying hot combustion products from the engine; a circumscribing wall surrounding the finned area and having a flanged lower face for mating engagement with a flanged opening through the wall of the exhaust manifold underneath the finned area; a partition clamped between the flanged faces of the circumscribing wall and the opening in the wall of the exhaust manifold for enclosing the fins in a chamber defined by the partition, the circumscribing wall, and the exterior wall of the intake manifold, the partition having an inlet port adjacent to one side of the circumscribing wall for introducing the combustion products into the chamber and an outlet port spaced from the inlet port adjacent to the opposite side of the circumscribing wall for exhausting the combustion products from the chamber; a projecting wall extending downward from the flanged opening into the exhaust manifold; and a butterfly type control valve mounted in the exhaust manifold in the way of the opening for rotation about a horizontal axis parallel to the wall between a first position and a second position, the valve when in the first position deflecting the flow of hot combustion gases through the inlet port to



contact the fins for heating the intake gases and for returning the combustion products to the exhaust manifold through the outlet port, the valve when in the second position substantially blocking the opening through the wall of the exhaust manifold to prevent the combustion gases from contacting the fins, and the valve coming into close contact with the projecting wall when the valve is in one of said first and second positions for preventing leakage of the combustion products around the valve when the valve is in said position, wherein the improvement comprises:

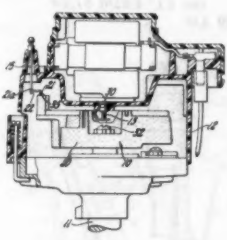
said partition being a thin plate and the projecting wall being formed integrally with the partition on a central portion of the under surface of said plate.

3,941,107

IGNITION DISTRIBUTOR ROTOR

Lynn A. Rockwell, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

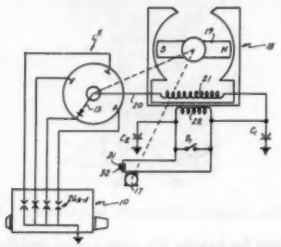
Filed Feb. 20, 1975, Ser. No. 551,380
Int. Cl.² F02P *1/00*
U.S. Cl. 123—146.5 A **4 Claims**



1. An ignition distributor rotor of the type which is rotated by a driving shaft within a distributor cap having a center input terminal and a plurality of output terminals circumferentially arranged about the input terminal comprising: a body member of an electrically nonconductive material adapted to be rotated by said driving shaft, a rotor electrode of an electrically conductive material in electrical circuit arrangement with said center input terminal and supported by said body member, said rotor electrode having a tip portion which is passed in spark gap relationship with successive ones of said output

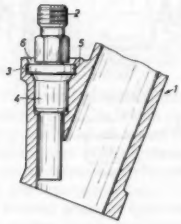
terminals as said body member is rotated by said shaft; and discrete electrically conductive means in bonded electrical contact with a selected area along opposite sides of said rotor electrode and said body member for electrically interconnecting said rotor electrode and said body member.

3,941,108
IGNITION BOOSTER
John P. Phillips, 625 Ester St., Michigan, Ind. 46360
Filed July 29, 1974, Ser. No. 492,866
Int. Cl.² F02P 9/00
U.S. Cl. 123—148 E **5 Claims**



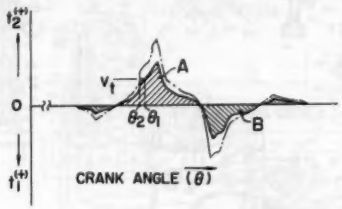
1. An ignition system for an engine comprising a magneto having a rotor and primary and secondary windings, a pair of breaker points connected across said primary winding and periodically opened and closed, a first capacitor connected between ground and one end of said primary winding, a distributor with a rotor to which one end of said secondary winding is connected, a second capacitor connected between the other end of said secondary winding and ground, and said distributory rotor, magneto rotor and said breaker points actuated by said engine.

3,941,109
ARRANGEMENT FOR MOUNTING A FUEL INJECTION NOZZLE
Wolfgang Schmid, Schwieberdingen, Germany, assignor to Dr. -Ing. H.c.F. Porsche Aktiengesellschaft, Germany
Filed Aug. 27, 1973, Ser. No. 391,845
Claims priority, application Germany, Aug. 31, 1972, 2242824
Int. Cl.² F02M 61/14
U.S. Cl. 123—139 AW **10 Claims**



1. In an internal combustion engine having a cylinder head and at least one fuel injection nozzle, an improved mounting arrangement for said fuel injection nozzle in said cylinder head, said improved mounting arrangement comprising:
- aperture means provided with respect to said cylinder head for receiving the nozzle therein, said aperture means including a recess means disposed within said aperture means, and
- elastic means coupled to said nozzle for form-lockingly engaging said recess means,
- wherein the nozzle is retained in said aperture means in a threadless and readily removable manner by said elastic means.

3,941,110
IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES
Tomoaki Sekiguchi, Hamamatsu, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Japan
Filed Dec. 27, 1972, Ser. No. 319,057
Claims priority, application Japan, Dec. 28, 1971, 47-2246; Oct. 31, 1972, 47-108453; Oct. 31, 1972, 47-125793
Int. Cl.² F02P 1/00
U.S. Cl. 123—148 CC **5 Claims**

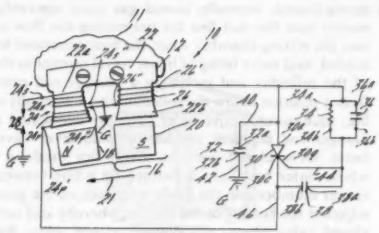


1. An ignition system for internal combustion engines, which comprises:
- an internal combustion engine;
- a generating coil provided in an electric generator which is rotated in synchronization with the internal combustion engine;
- a capacitor connected to said generating coil so as to be charged by an output of the generator which is developed over the generating coil;
- a switching element connected in parallel with said coil and with said capacitor for controlling the charge and discharge of the capacitor;
- a switching element controlling means for controlling the operation of the switching element, which means include a device for minimizing the variation of the operating voltage of the switching element and a diode connected to the generating coil so as to control the operation of said device; and
- in which said switching element controlling means further comprises a monostable multi-vibrator whose output is applied as a trigger signal to the switching element thereby to render the latter conductive, said monostable multi-vibrator being controlled by the operation of said device for minimizing the variation of the operating voltage of the switching element.

3,941,111
IGNITION SYSTEM
Thomas F. Carmichael, Drayton Plains, and Richard J. Maier, Pontiac, both of Mich., assignors to Syncro Corporation, Oxford, Mich.
Filed Sept. 10, 1973, Ser. No. 395,908
Int. Cl.² F02P 3/08, 3/06
U.S. Cl. 123—148 E **42 Claims**

1. In a capacitor discharge ignition system the combination comprising a single charging and triggering coil, means for energizing said coil with a time-varying magnetic flux to thereby induce a time-varying voltage in said coil which voltage includes repetitive pulses of one polarity, an ignition coil comprising a primary winding and a secondary winding, a spark plug connected across said secondary winding, a capacitor, charging circuit means coupling said capacitor with said charging and triggering coil for causing said capacitor to be

charged by said coil in response to an initial portion of each of said pulses, discharge circuit means operatively coupling said capacitor with said primary winding so that said capacitor can discharge into said primary winding to cause said spark plug to fire, said discharge circuit means including a solid state switch having first and second terminals via which terminals said capacitor discharges into said primary winding when said switch is actuated and a third terminal constituting a triggering terminal via which said switch is actuated in response to a



triggering signal applied thereto, and triggering circuit means operatively coupled with said discharge means and with said single charging and triggering coil for causing said capacitor to discharge into said primary winding in response to a portion of each of said pulses occurring after said initial portion thereof, said triggering circuit means including a capacitor voltage dividing network connected to said coil with said third terminal connected to an intermediate point thereof, and a resistor connected in parallel with a portion of said capacitor voltage dividing network.

3,941,112

IGNITION DEVICE FOR INTERNAL COMBUSTION ENGINES

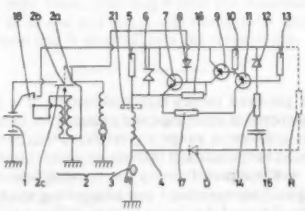
Roger Jean Habert, Paris, France, assignor to Ducellier et Cie, Paris, France

Filed June 19, 1974, Ser. No. 480,719

Claims priority, application France, June 22, 1973, 73.22873

Int. Cl.² F02P *3/04*

U.S. Cl. 123—148 E **5 Claims**



1. An ignition device for an internal combustion engine comprising: a contact breaker;

an ignition coil having a low voltage primary winding adapted to be connected to an electrical battery through said contact breaker; and

a high voltage secondary winding adapted to be connected consecutively to engine spark plugs through a distributor;

a current limiting resistance connected in series with said primary winding; and

electronic means connected in parallel with said resistance for shunting out said resistance for a specific predetermined time interval of the total time of closure of said contact breaker, independently of ambient temperature and engine speed.

3,941,113

MULTICYLINDER HEAT ENGINES

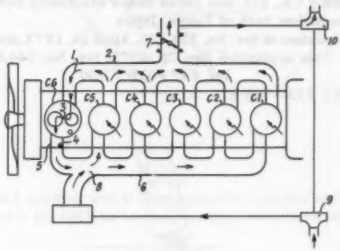
Yves Baguelin, Louveciennes, France, assignor to Societe Anonyme de Vehicules Industriels et d'Equipement Mechaniques Saviem, Suresnes, France

Filed Nov. 11, 1974, Ser. No. 522,532

Claims priority, application France, Nov. 28, 1973, 73.42412

Int. Cl.² F02N *17/00*

U.S. Cl. 123—179 R **8 Claims**



1. A heat engine comprising at least one recycling cylinder having a given compression ratio, at least one motive cylinder having a compression ratio less than that of said recycling cylinder and means for passing exhaust gases from said motive cylinder to said recycling cylinder, said recycling cylinder being operable to provide motive power only during starting operation of the engine.

3,941,114

CYLINDER-CRANKCASE STRUCTURE OF CAST HOUSING ELEMENTS CONNECTED IN SERIES

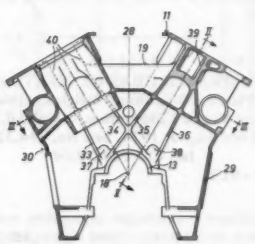
Richard Seifert, Friedrichshafen, Germany, assignor to Motoren-und Turbinen-Union Friedrichshafen GmbH, Germany

Filed Nov. 27, 1973, Ser. No. 419,333

Claims priority, application Germany, Dec. 8, 1972, 2260142

Int. Cl.² F02F *1/00*

U.S. Cl. 123—195 R **14 Claims**



1. A cylinder-crankcase structure for a multi-cylinder internal combustion engine with a V-arrangement of the cylinders which is welded together of cast housing-elements that are connected in series with each other in a building block manner, each of the housing-elements including a unitary cross wall means having a bearing socket half for a crankshaft bearing and two cylinder shell means for each cylinder row, the two cylinder rows being offset with respect to one another substantially by the width of a connecting rod bearing and the

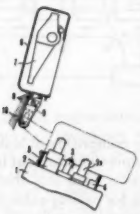
separating plane of the housing-elements being offset with respect to the cylinder centers, characterized in that the cross wall means includes an upper boundary which, at least in plan view, extends substantially rectilinearly and at an inclination to the center cross plane of a respective housing element, and in that imaginary lines starting from said upper boundary and extending substantially in a neutral center surface of the cross wall means in the direction toward the area of the bearing socket are straight lines.

3,941,115

ENGINE COVER SUPPORTING APPARATUS OF INTERNAL COMBUSTION ENGINES

Naoyashi Tshida; Atsushi Watanabe, and Yukio Ishii, all of Tamano, Japan, assignors to Mitsui Shipbuilding and Engineering Co., Ltd. and Japan Ship's Machinery Development Association, both of Tokyo, Japan

Continuation of Ser. No. 354,742, April 24, 1973, abandoned.
This application Jan. 28, 1975, Ser. No. 544,847
Int. Cl.² F02B *77/00*
U.S. Cl. 123—198 E **4 Claims**



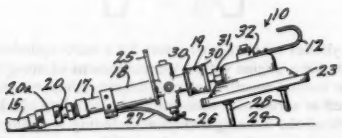
1. In an engine, a two part cover secured to the cylinder head of a heavy internal combustion engine and adapted to be stored when removed, said cover comprising a lower section secured to the cylinder head of said engine to surround the suction and exhaust valves, and an upper section removably mounted on said lower section and adapted to be stored when removed; an operating mechanism of said suction and exhaust valves pivotally mounted in said upper section, an arm secured at one end to said upper section; means for pivotally securing the other end of said arm to a stationary support located close to one side of said engine; and retaining means for said upper section for holding said upper section in a stored position so as to expose said cylinder head and said valves with said retaining means operable for releasing said upper section from said stored position to return to its mounted position on said lower section.

3,941,116

INFRARED HEAT GENERATOR

Eugene W. Placek, Middleburg Heights, Ohio, assignor to International Magna Corporation, Cleveland, Ohio

Filed Aug. 2, 1974, Ser. No. 494,324
Int. Cl.² F24C *3/04*
U.S. Cl. 126—92 B **2 Claims**



1. In a gas-fired infrared heat generator including a fuel line for connection to a fuel tank, an air intake within the line, a mixing chamber connected to the downstream end of the fuel line, a mantle defining a forward boundary of the mixing chamber, an outer grid disposed outwardly from the mantle, a reflector disposed peripherally about the mantle and grid, a handle extending along the fuel line generally parallel to the faces of the mantle and the reflector, and a lower extremity adjacent the bottom of the handle, the improvement comprising:

at least one spacer member mounted on the reflector and extending outwardly forward therefrom for maintaining the outer grid a predetermined distance from an adjacent surface; and

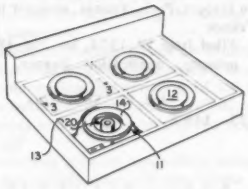
a spring-biased, normally closed gas valve operably connected into the fuel line for preventing the flow of fuel into the mixing chamber when the heat generator is unattended, said valve being of linear travel normal to the face of the reflector and including a plunger rod extending from a position below the reflector and a manually operable, squeezeresponsive lever operably connected to the plunger rod adjacent the handle, said lever having an outer valve closed position which lies inside a space whose outer boundary is defined by a line between the spacer member and the lower extremity of the generator adjacent the bottom of the handle, whereby said normally closed valve closes and remains closed when the heat generator rests face down and unattended against a surface.

3,941,117

COOKTOP FOR A GAS-FIRED RANGE

Yu K. Pei, and Jack J. Tyson, both of Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Oct. 21, 1974, Ser. No. 516,376
Int. Cl.² F24C *3/04*
U.S. Cl. 126—215 **4 Claims**

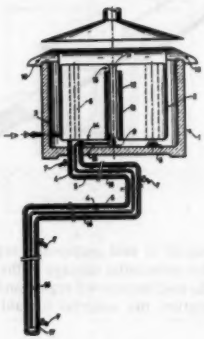


1. In a gas-fired range, the combination of a gas burner means supported in said range and operable for combustion of a gaseous mixture, a range top surface, the burner means being spaced below said top surface, an annular semi-torroidal concave well support forming an intermediate ring gutter encircling said burner means and terminating at an innermost annular downturned rim flange portion defining an annular lip disposed above the gutter portion, a glass-ceramic plate member comprising an annular plate surface and plural, peripherally spaced, downwardly depending legs on the undersurface of said plate, said plate member and plurality of legs thereon are integral and formed together as a unit from a crystallizable glass material, the lower extremities of said legs each having a contoured lower end surface including a conforming concave notch matching said annular lip of the well support which cooperates with said lip for supporting said plate in stable flat position in an overlying spaced relation to said burner means, said legs maintaining the plate member elevated above and spaced from the range top surface and in overlying spaced relation to said burner means.

3,941,118
HOT WATER SUPPLY SYSTEM

Hendrik Schutte, Kampen, Netherlands, assignor to Air-O-Mulder B.V., Netherlands

Filed Apr. 30, 1975, Ser. No. 573,086
Claims priority, application Netherlands, May 10, 1974, 7406357
Int. Cl.² F24H *1/00*
U.S. Cl. 126—362 1 Claim



1. A hot water supply system comprising a gas-heated hot water reservoir consisting of a vessel with a connection for the supply of cold water and with an insulated distribution line for hot water, a plurality of taps spaced along the distribution line, a vertical channel extending through the vessel, further provided with at least one gas burner with a pilot burner, the latter burner being placed underneath said vertical channel, an insulating jacket being mounted in the vessel around the channel in spaced relationship therefrom, and forming an annular space therebetween this jacket bearing sealingly on the bottom of the vessel, but at the upper end leaving a passage leading to the remaining portions of the vessel, a thin circulation pipe being arranged within the distribution line, which pipe at its one end opens into the annular space whilst the other open end is situated near the farthest tap.

3,941,119
MEANS FOR INTRODUCING AND GUIDING OBJECTS INTO BODY CAVITIES AND BLOOD VESSELS

Mario Corrales, Artillergatan 45, Stockholm, Sweden

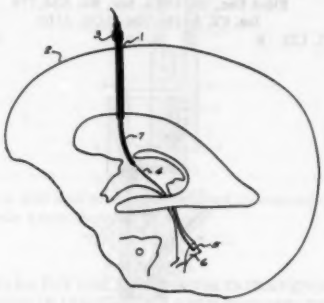
Filed July 19, 1974, Ser. No. 489,928
Claims priority, application Sweden, July 20, 1973, 7310149
Int. Cl.² A61M *25/00*
U.S. Cl. 128—2 M 10 Claims

1. Means for introducing a catheter into a selected portion of a patient, for conducting an object to such portion via the catheter, comprising:

a. a cannula for insertion into an opening in the patient;

b. a catheter slidably received in and externally guided by said cannula, said catheter having an inner flexible portion projecting inwardly beyond said cannula; and

c. a freely flexible elongated member movable in response to gravity to such portion of a patient, and providing internal guidance for said inner flexible portion of said catheter, whereby said flexible member is moved by gravity through said cannula to the selected portion, then serves as a guide for insertion of said catheter to said

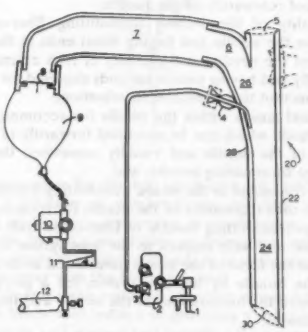


selected portion, and is then removed from the catheter to enable the catheter to pass the object to said portion.

3,941,120
VENTILATING ENDOSCOPES

Shaotsu Thomas Lee, 121 Waialeale St., Honolulu, Hawaii 96825

Continuation of Ser. No. 249,665, May 2, 1972, abandoned.
This application Jan. 16, 1975, Ser. No. 541,403
Int. Cl.² A61B *1/00*
U.S. Cl. 128—4 10 Claims



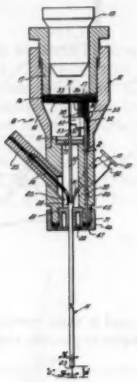
1. Ventilating endoscope apparatus comprising an elongated endoscope having a length greater than a width, having a continuously open proximal end and a continuously open distal end, and an elongated wall means for laterally enclosing the scope between the open ends, thereby defining a lumen continuously open at opposite ends, fluid inlet means connected to and opening at a small angle along the wall means near the proximal end and fluid pressure means connected to the inlet means and the inlet means opening into the lumen in a direction toward the distal end for passing fluid from the inlet means into the lumen toward the distal end and entraining air through the proximal end into the lumen.

3,941,121

.FOCUSING FIBER-OPTIC NEEDLE ENDOSCOPE

Charles P. Olinger, Cincinnati, Ohio; Ronald L. Ohlhaber, and Casey Kot, both of Chicago, Ill., assignors to The University of Cincinnati, Cincinnati, Ohio

Filed Dec. 20, 1974, Ser. No. 534,779
Int. Cl. A61b *1/06, 1/26, 1/30*
U.S. Cl. 128—6 40 Claims



1. A fiber-optic needle endoscope for viewing objects and comprising:

a hollow elongated needle,

an image transmitting lens system at a forward end of the needle,

an elongated image transmitting bundle of fiber-optic rods within the needle, said bundle having a distal end near the forward end of the needle in operative disposition with respect to said lens system, and the bundle extending rearwardly from said distal end to a proximate end thereof rearwardly of the needle,

a plurality of illumination transmitting fiber-optic rods within the needle and having distal ends at the forward end of the needle, said plurality of rods extending rearwardly and having proximate ends disposed for operative connection to a source of illumination,

a channel means within the needle for accommodating an electrode which can be extended forwardly of the distal end of the needle and visually supervised through the image transmitting bundle, and

means connected to the image transmitting bundle of fiber-optic rods rearwardly of the needle for reciprocating the image transmitting bundle of fiber-optic rods within the needle and with respect to the lens system in order to adjust the focus of the image transmitted to the distal end of the bundle by the lens system for a given distance between the forward end of the needle and the object to be viewed.

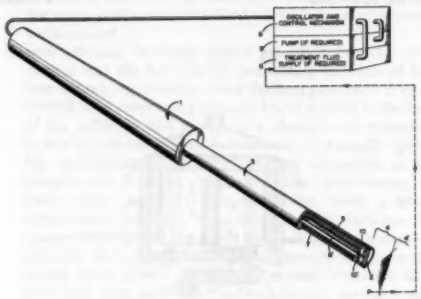
3,941,122

HIGH FREQUENCY ULTRASONIC PROCESS AND APPARATUS FOR SELECTIVELY DISSOLVING AND REMOVING UNWANTED SOLID AND SEMI-SOLID MATERIALS AND THE LIKE

Joie P. Jones, Sherborn, Mass., assignor to Bolt Beranek and Newman, Inc., Cambridge, Mass.

Filed Apr. 8, 1974, Ser. No. 458,793
Int. Cl.[2] A61H *23/00;* A61B *17/00*
U.S. Cl. 128—24 A 26 Claims

1. A process for selectively dissolving solid and semi-solid materials, comprising producing ultrasonic-frequency energy of the order of at least 90–100 Mhz, propagating such energy as a radiated acoustic wave from a predetermined region and upon material-to-be dissolved at a juxtaposed region to subject the material to the radiated acoustic wave energy and thereby dissolve the material locally into cellular components at said juxtaposed region thereof substantially normal to the wavefront of the acoustic wave and rapidly attenuating the



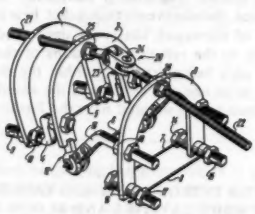
energy in the material at said juxtaposed region to prevent dissolving and other substantial damage to the portions of the material external to said juxtaposed region and to prevent any substantial temperature rise external to said juxtaposed region.

3,941,123

APPARATUS FOR JOINT MOVEMENT RESTITUTION

Mstislav Vasilievich Volkov, 1 Stroitelnaya ulitsa, 6, korpus 1, kv. 63, and Oganes Vardanovich Oganesian, ulitsa Pervomaiskaya, 74, kv. 87, both of Moscow, U.S.S.R.

Filed May 20, 1975, Ser. No. 579,066
Int. Cl.[2] A61F *5/04*
U.S. Cl. 128—84 B 1 Claim

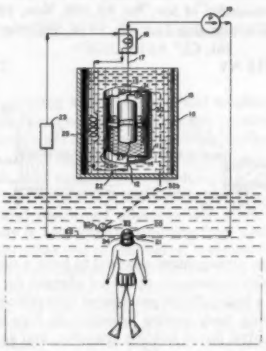


1. An apparatus for joint movement restitution, comprising two pairs of needles each of which is designed to be driven through one of the joint ends, one of said needles being aligned with the pivotal axis of the joint; at least two braces, the tips of said needles of one of said pairs of needles being secured in each of said braces so that said brace together with said needles defines a rigid system to be secured on the respective joint end; two ball joints disposed on both ends of said needle to be aligned with the pivotal axis of the joint, said ball joints being so arranged that the fulcrums thereof lie on the longitudinal axis of said needle; two distractors interconnecting said rigid systems, said distractors being fixed to one of said systems and connected to the other by way of said ball joints.

3,941,124
RECIRCULATING BREATHING APPARATUS AND METHOD

Newell C. Rodewald, c/o Frank Wattles, P.O. Box 1514, Manhattan Beach, Calif. 90266, and Jerry E. Sinor, 6667 Birdcliff Way, Longmont, Colo. 80501

Filed Jan. 21, 1969, Ser. No. 792,874
Int. Cl.[2] A62B 7/06
U.S. Cl. 128—142 15 Claims



1. Apparatus for supplying a variable, controlled composition of a breathable gas mixture through oxygen in liquid-vapor form to a ventable breathing means at a variable ambient pressure, said apparatus comprising:

a container (for the oxygen in liquid-vapor form) having an inlet and an outlet and adapted to hold oxygen in liquid-vapor form, said inlet located below the normal surface level of the liquid oxygen and said outlet located above the normal surface level of the liquid oxygen;

an inhale conduit at one end connected to the container outlet and at the other end adapted to be connected to the breathing means;

an exhale conduit at one end connected to the container inlet and at the other end adapted to be connected to the breathing means thereby forming a loop wherein gas exhaled by a user at the breathing means passes through the exhale conduit to the container where poisonous components of the gas are frozen out and the remaining gas bubbles through the oxygen in liquid-vapor form to replace consumed oxygen and the resultant gas is supplied to the user through the inhale conduit; and

means for heating the gas in the inhale conduit to substantially the temperature at which the gas is breathed.

3,941,125
TUBULAR GAUZE BANDAGE APPLICATOR

Arvel Drake, 149 Short View Drive, Des Moines, Iowa 50312

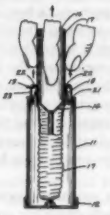
Filed Feb. 28, 1975, Ser. No. 554,130
Int. Cl.[2] A61F 13/00
U.S. Cl. 128—155 19 Claims

1. A tubular bandage applicator comprising:

a substantially hollow housing having an opening therein;

a rod connected at one end thereof to the interior of said hollow housing;

a tube connected to the other end of said rod;

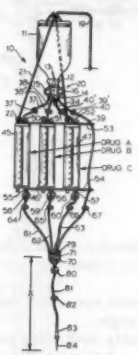


said rod and said tube being adapted to coaxially receive tubular gauze thereon.

3,941,126
APPARATUS FOR LONG TERM INTRAVENOUS ADMINISTRATION OF DILUTED INCOMPATIBLE MULTIPLE MEDICATIONS

Joseph W. Dietrich, 4653 Bromfield Ave., Virginia Beach, Va. 23455, and Eugene J. Lubimov, 668 Sirine Ave., Virginia Beach, Va. 23458

Filed Aug. 8, 1974, Ser. No. 495,652
Int. Cl.[2] A61M 5/14
U.S. Cl. 128—214 R 10 Claims



1. An apparatus for diluting, combining, and intravenously injecting a plurality of potentially incompatible substances including medications comprising, in combination:

a. a bottle having a penetrable vented stopper and containing a supply of a selected diluent to be withdrawn through the stopper with the bottle inverted;

b. an integral spike-manifold structure adapted for placement below said bottle and providing a spike adapted to penetrate said stopper and provide a fluid passage therethrough and communicating with said passage a manifold providing a plurality of discharge ports enabling said diluent to be withdrawn from said bottle through said spike and made available for discharge through each of said ports, said manifold structure having a finger grip formation formed integral therewith and adapted to receive an operator's fingers for installing said spike;

c. a plural configuration of tubes, sight chambers, valves and vertically disposed calibrated transparent containers supported below said bottle and spike-manifold structure and providing means whereby various incompatible substances such as medications may be isolated in measured amounts and diluted with the same said diluent while remaining in isolation from each other and at individually

controlled rates of flow therethrough, each container having a top inlet port, a tube connection between such inlet port and a respective said manifold discharge port, a bottom outlet port and a bottom tube connected thereto and leading downward therefrom, each bottom tube having in its path a sight chamber and a regulator valve for individually regulating the flow therethrough;

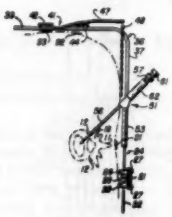
d. a mixing-sight chamber having on one upper side a plurality of inlets connected respectively to said bottom tubes for individually receiving and then combining the individually mixed medication-diluent fluids discharged by said containers and on an opposite lower side a discharge port; and

e. a fluid injection assembly including a tube having in its path a further sight chamber and regulator valve and said assembly being connected on one end to said mixing-sight chamber discharge port and on the opposite end to a needle for vein injection.

3,941,127
APPARATUS AND METHOD FOR STEREOTAXIC LATERAL EXTRADURAL DISC PUNCTURE

Edward C. Froning, 215 N. San Mateo Drive, San Mateo, Calif. 94403

Filed Oct. 3, 1974, Ser. No. 511,655
Int. Cl.² A61M 5/00
U.S. Cl. 128—215 **32 Claims**



1. Apparatus for lateral extradural disc puncture comprising a frame for fixation to a patient,

an offset index,

a needle angle guide connected to said offset index at a predetermined angle,

first means adjustably positioning said offset index relative to said frame to determine the position of said needle angle guide both from the midsaggital plane of the patient and longitudinally relative to the intervertebral discs of said patient,

a heading guide,

second means adjustably positioning said heading guide relative to said frame longitudinally relative to said patient,

and plumb line establishing means on said heading guide positioned to hang down the back of the patient into proximity to said needle angle guide.

25. A method for stereotaxic extradural disc puncture comprising the steps of:

first making a radiographic image in vertical projection and determining from said image the depth from the skin surface of the intervertebral disc into which a pharmaceutical is to be injected;

second, making a radiographic image in vertical projection and determining a heading along a line viewed in vertical projection bisecting the angle between the end plates of the vertebrae to either side of said disc;

third, locating the site of skin puncture by measuring vertically from the midsaggital plane a distance calculated from the tangent of the desired angle of needle penetration and said depth in the vertical plane of said heading;

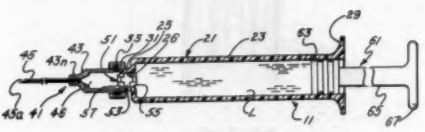
fourth, inserting a needle into the patient at said site at said angle of penetration and radiographically monitoring penetration of said needle on said heading until said disc is penetrated inward of the facet joint adjacent said disc; and

injecting a pharmaceutical through said needle into said disc.

3,941,128
FLUID DISPENSING ARRANGEMENT

Brian E. Baldwin, Wilmette, Ill., assignor to Affiliated Hospital Products, Inc., St. Louis, Mo.

Continuation of Ser. No. 359,265, May 11, 1973, abandoned, which is a continuation of Ser. No. 88,360, Nov. 10, 1970, abandoned. This application Oct. 18, 1974, Ser. No. 515,966
Int. Cl.² A61M 5/00
U.S. Cl. 128—218 NV **22 Claims**



1. For use in an arrangement adapted to have a dispensable liquid therein, with a manually operated plunger for injecting said liquid into a body, the improvement comprising:

a liquid-carrying body having adjacent its forward end a mouth, a central liquid-holding chamber, and an opposite open end for receiving said plunger to effect movement of liquid to or from said chamber and through said mouth,

a manually operated plunger slidable in said chamber to effect movement of liquid to or from said chamber and through said mouth, said body having a dispensing end forward of said mouth,

a combination sealing and by-pass valve plug having a radially compressible, relatively soft elastic midsection initially seated within and sealing said mouth in a radially elastically compressed condition of the plug,

a by-pass chamber and associated connecting liquid discharge opening formed forward of said mouth,

said by-pass chamber having forward and rear liquid-passageway-forming ends, said forward liquid-passageway-forming end forming a portion of said dispensing end of said body,

said by-pass chamber being larger in internal cross-section than said mouth and larger in all cross-sectional directions in cross-sectional chamber extent than the respective corresponding elastically free or released effective external sealing configuration of said plug and having an effective combined longitudinal and cross-sectional extent of sufficient amount whereby said plug will have freedom of movement in both longitudinal and lateral directions when ejected to its free condition into said chamber,

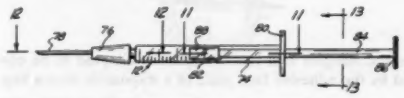
said plug having a second displaced free position and condition in said by-pass chamber, in which second position and free condition said plug is smaller than the corresponding cross-section in all cross-sectional directions of said by-pass chamber and larger in effective cross-section than said mouth,

the opposite ends of said plug being non-complementarily shaped relative to the opposite longitudinal ends of said by-pass chamber, so as to enable liquid to pass therepast when the plug is in end engagement with either the forward or rear end of said by-pass chamber, after removal of the plug from its sealing position within said mouth and into said by-pass chamber,

said plug being of a normal cross-section in its elastically free or relaxed condition sufficiently greater than said mouth of said body to prevent, in conjunction with one of

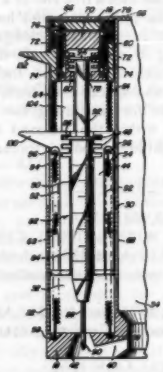
its non-complementarily shaped ends, reverse movement thereof back into sealing relation within said mouth as a function of reverse or aspirating flow of liquid therepast.

3,941,129
QUANTITY INDICATING INJECTION DEVICE
Ida M. Pleznac, 7837 Manor Blvd., Dearborn, Mich. 48126
Filed Dec. 10, 1974, Ser. No. 531,212
Int. Cl.² A61J 1/00; A61M 5/315
U.S. Cl. 128—218 R **5 Claims**



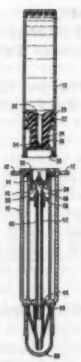
1. An injecting device for medical solutions comprising a sealed cylindrical tubular medicament receiving and dispensing barrel member having indicia means thereon and including a needle means on one end and an acutating means on the other end, said actuating means having a sliding fluid tight drive piston thereon and received in the inside of said barrel member and positioned adjacent said other end, a medicament cavity in said barrel extending from said one barrel end toward said other end of said barrel, a means for indicating the quantity of medicament in said barrel cavity comprising a snug fitting plunger means also slidingly received in said barrel means with one end abutting but unattached to said piston and the other end facing said medicament cavity, said snug fitting plunger means having at least one longitudinally extending fluid by pass hole therethrough and defining a non-retractable plunger stopper whereby pressure by the piston on said non-retractable plunger aspirates residual medicament in said cavity and the non-retractable plunger stopper will remain in a fixed position in the barrel so that the indicia will indicate the position of the plunger and residual quantity of medicament is remaining in the barrel cavity.

3,941,130
SEQUENTIAL TRIGGER RELEASE FOR INJECTION DEVICE
Robert C. Tibbs, Hospital Drive, Cleveland, Miss. 38732
Filed Mar. 18, 1975, Ser. No. 559,505
Int. Cl.² A61M 5/22
U.S. Cl. 128—218 A **12 Claims**



1. In combination, a support, a syringe barrel holder mounted on said support for reciprocal shifting along a predetermined path relative to said support in opposite first and second directions for projecting and retracting, respectively, a needle carried by a syringe mounted on said holder, a syringe plunger holder supported from said barrel holder for reciprocal shifting along said path relative to said barrel holder, means yieldingly biasing said holders in said first direction, first and second deactivatable means for retaining said barrel and plunger holders, respectively, against movement in said first direction relative to said support, said first and second deactivatable means including first and second latch members, respectively, shiftably supported from said support for movement between active and inactive positions and retentively engaging said holders when in said active positions, an operator guidingly mounted on said support for back and forth movement between an inactive position, a first active position and a second active position shifted through said first active position, said latch members and said operator including coacting means operable to shift said first latch member from its active position to its inactive position upon movement of said operator from its inactive position to its first active position and to shift said second latch member to its inactive position upon subsequent movement of said operator through its first active position to its second active position.

3,941,131
DEVICE FOR ADMINISTRATION OF VISCOUS FLUIDS FOR THE URETHAL TRACT
Robert W. Ogle, Newport Beach, Calif., assignor to IMS Limited, South El Monte, Calif.
Continuation of Ser. No. 186,726, Oct. 5, 1971, abandoned.
This application Aug. 8, 1973, Ser. No. 386,615
Int. Cl.² A61M 1/00
U.S. Cl. 128—237 **9 Claims**



1. A novel device for the administration of viscous fluids comprising:
a barrel having an open end and a closed end,
a thrust portion within said barrel and terminating in proximity to the open end of said barrel,
projecting upward within said thrust portion a fluid passage member terminating within said thrust portion, said fluid passage having a central bore of a diameter sufficient to readily allow the passage of thick viscous fluid therethrough,
a flange on said fluid passage member adapted to limit the lateral movement of said fluid passage member with relation to said thrust portion to maintain an essentially concentric relationship therebetween, the largest diameter of said flange being less than the internal diameter of said thrust portion,

a tip carried on said fluid passage above said flange and comprising at its upper end a solid puncturing point below which is a zone of generally larger diameter than said point, the interior of said zone communicating with said central bore, said zone having one or more orifices therein to provide fluid communication between the central bore and the exterior of said zone,

an elongated urethral tip having a hollow internal central bore extending from said barrel which communicates with said central bore of said fluid passage, the bore of said tip being at least equal in inside diameter to the inside diameter of said fluid passage, said tip having a smooth rounded end and a hole in said rounded end which serves as an outlet for said central bore, immediately above said end a cylindrical portion, said end and cylindrical portion being adapted to be received within the urethral tract, above said cylindrical portion, an externally tapered portion extending toward said barrel and having its largest external diameter at said barrel, the exterior of said tapered portion sealing the urethral tract during injection,

a vial having an open end and a closed end, said vial containing a thick viscous fluid,

a resilient reciprocating stopper sealing on the walls of said vial, said stopper having a center hole therein bridged by an imperforate diaphragm,

said diaphragm being adapted to be punctured by said puncturing point, and the center hole of said stopper being larger in internal diameter than the exterior of said zone in proximity to said orifices,

means on said resilient reciprocating stopper and said thrust portion whereby said stopper and thrust portion are interlocked and said stopper can be reciprocated whithin said vial by pushing or pulling on said vial.

3,941,132

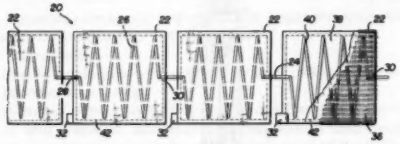
INTERCONNECTED SURGICAL SPONGES

Arlene Lenaghan, 486 Wishbone Drive, Bloomfield Hills, Mich. 48013

Filed Nov. 27, 1974, Ser. No. 527,733

Int. Cl.² A61F *13/00*

U.S. Cl. 128—296 **14 Claims**



1. A plurality of serially interconnected surgical sponges for absorption of body fluids, comprising: a flexible linear element and at least two surgical sponges located along the length of said linear element, at least one of said sponges affixed to said element, the length of said linear element being greater than the composite length of said sponges and said element having a gathered portion greater in length than the length of a sponge, means releasably retaining substantially the entire gathered length of said linear portion to said sponge whereby said gathered portion is extensible between said sponges when tensioned for selectively and successively increasing the length between said sponges.

3,941,133

STOMAL DEVICES HAVING CONTROLLED RELEASE

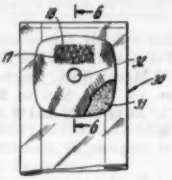
James Ling Chen, East Brunswick, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Oct. 4, 1974, Ser. No. 512,278

Int. Cl.² A61F *5/44*

U.S. Cl. 128—283 **21 Claims**

1. A peristomal covering comprising an adhesive member attached to a polymeric backing member having an embossed geometric pattern wherein the exposed surface of said backing member has continuous raised uncoated ridges separating the



geometric dimples said raised surface is adapted to be contacted by the adhesive face plate of a disposable stoma bag.

3,941,134

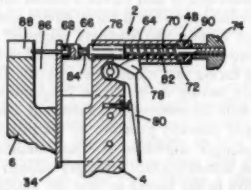
APPARATUS FOR PIERCING EARLOBES

Maxwell Wilson McDonald, Mill Valley, Calif., assignor to Golden M Enterprises, Inc., Mill Valley, Calif.

Filed Jan. 17, 1974, Ser. No. 435,394

Int. Cl.² A61B *17/00*

U.S. Cl. 128—330 **10 Claims**



1. In an earlobe piercing device having first and second jaws mounted for parallel relative movement towards and away from each other, a pressure plate attached to the first jaw in parallel and spaced-apart relation thereto for movement of the plate with the first jaw towards and away from the second jaw, a piston slideably mounted on the first jaw including a recessed bore for receiving a head of a piercing stud, and means for forcing the piston in an axial direction towards the second jaw so that an earlobe placed between the second jaw and the pressure plate can be pierced with a free end of a stud inserted in the recessed bore of the piston, the stud having a given diameter, the improvement comprising an elongate slot in the pressure plate terminating in a bottom wall, the slot being laterally aligned with the axis of the piston, the bottom wall being parallel to the axis and spaced therefrom substantially one-half the stud diameter for supporting the stud while a head thereof is disposed within the recessed bore and for guiding the stud in a straight line when it is forced towards the second jaw.

3,941,135

PACEMAKER WITH BIOFUEL CELL

Ferdinand von Sturm, and Gerhard Richter, both of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Mar. 24, 1975, Ser. No. 561,337

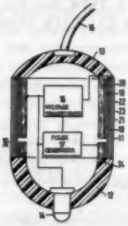
Claims priority, application Germany, Mar. 29, 1974, 2415385

Int. Cl.² A61N *1/36*

U.S. Cl. 128—419 PS **9 Claims**

1. In a heart pacemaker which includes a stimulating electrode and counter electrode, a pulse generator and an implantable glucose-oxygen biofuel cell as the energy supply, the improvement comprising a glucose electrode in the biofuel

cell which has an area larger than that of the stimulating electrode and wherein the stimulating electrode is electrically



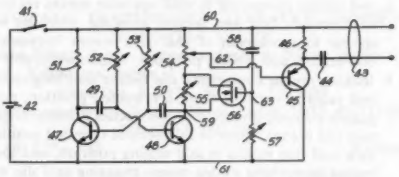
connected to the glucose electrode so as to be at essentially the same potential as the glucose electrode.

3,941,136

METHOD FOR ARTIFICIALLY INDUCING URINATION, DEFECATION, OR SEXUAL EXCITATION

Louis Bucalo, Holbrook, N.Y., assignor to Neuronyx Corporation, Holbrook, N.Y.

Filed Nov. 21, 1973, Ser. No. 418,106
Int. Cl.² A61N 1/36
U.S. Cl. 128—422 **15 Claims**



1. In a method of artificially inducing one of a plurality of body functions, namely urination, defecation and sexual excitement, comprising the steps of applying at least to a region of the crotch which does not form part of an appendage electrical pulses which have for said one body function a given voltage, frequency and duration.

3,941,137

AMBULATORY STIMULATOR

Jakob Vredenbregt; Antonius Maria Klomp, and Adrianus Cornelis Maria Hurkmans, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 24, 1972, Ser. No. 228,912
Claims priority, application Netherlands, Feb. 27, 1971, 7102659
Int. Cl.² A61N 1/36
U.S. Cl. 128—423 R **1 Claim**

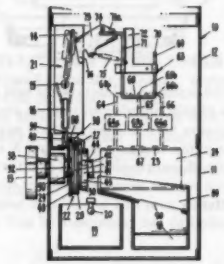
1. An electro-therapeutic apparatus for the stimulation of locomotive organisms which normally function inadequately comprising a pressure-sensitive mechanism located underneath the ball of a foot of one of the legs of the patient for producing periodic pressure pulses, a switching element connected with said mechanism being activated by said pressure pulses from said mechanism for producing electric pulses, stimulator means connected to said switching element having a stimulatory electrode carried on each leg of the patient each being periodically activated by said electric pulses in response to said pressure pulses originating from said pressure sensitive mechanism, said electrodes comprising a central electrode element, a second electrode surrounding said central electrode, insulating means provided between said central and second electrodes, said second electrode being made of an electrically conducting gauze, and an electrically conducting rubber element for providing contact between said second electrode and the skin of the patient.

3,941,138

MACHINE FOR DISPENSING COINAGE CHANGE

John Carrick Woodhouse, 91 Nepean Highway, Mentone, Victoria, Australia (3194)

Filed June 10, 1974, Ser. No. 478,044
Claims priority, application Australia, June 8, 1973, 3589/73
Int. Cl.² G07D 1/06
U.S. Cl. 133—2 **13 Claims**



1. A machine for dispensing coinage change, including means for receiving a coin for which change is required, means operative in response to the receipt of said coin for advancing a conveyor means beneath a plurality of change coinage supply tubes, and means adapted to receive and deliver change from said conveyor means, wherein there is at least one row of supply tubes extending in the direction of motion of said conveyor means, each row containing a plurality of said supply tubes, said conveyor means including at least one row of recesses adapted to collect coinage from an advanced supply tube only after a supply tube trailing said advanced tube, in a particular row of tubes, fails to deliver a coin for collection by said conveyor means, the upper edge of each of said recesses lying in a plane proximate the bottom of said supply tubes, whereby the presence of a coin in said recess will preclude the delivery of a coin from an associated supply tube, and wherein a sensing mechanism is provided including at least one stop rod biased toward a position against the coin in a particular row on the conveyor means just prior to the point of delivery from said conveyor means, whereby upon an empty recess passing beneath said stop rod the rod will move through an aperture in said recess under the action of its biasing means to close, by means of an associated linkage system, a coin entry aperture to the machine and at the same time jam the conveyor means against further advanced movement.

3,941,139

DISHWASHER SPRAY ASSEMBLY WITH INTERMITTENTLY OPERATING NOZZLES

Raymond William Spiegel, Stevensville, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Aug. 15, 1974, Ser. No. 497,816
Int. Cl.² B08B 3/02
U.S. Cl. 134—176 **11 Claims**

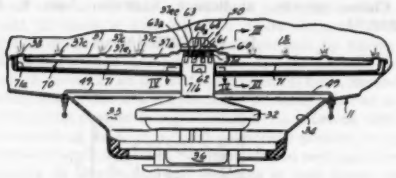
1. A dishwashing machine having a washing chamber, at least one rack for supporting dishes within said chamber and apparatus for distributing wash liquid onto dishes within said rack, said apparatus comprising:

a pump means having an outlet positioned below said rack for supplying wash liquid under prssure within said chamber;

at least one hollow spray device rotatably mounted within said chamber in operative relation with said rack and in fluid communication with said outlet of the pump means;

means for continuously rotating said spray device in a unidirectional manner;

a plurality of nozzles carried by said spray device for providing fluid communication between said spray device and said washing chamber; and



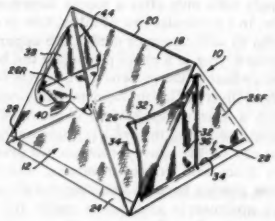
means for fluid-isolating at least one of said nozzles from the remainder of said plurality of nozzles and providing fluid communication between the isolated nozzle and the outlet of said pump means only during a select portion of each unidirectional revolution of said spray device as said spray device rotates about said outlet so that wash liquid is intermittently supplied to said one nozzle and continuously supplied to the remainder of said plurality of nozzles.

3,941,140

FOLDABLE FREE-STANDING TENT, FRAME AND SUBFRAME THEREFOR

Allan E. Beavers, Littleton, Colo., assignor to T. A. Pelsue Company, Englewood, Colo.

Filed Oct. 31, 1974, Ser. No. 519,624
Int. Cl.² A45F *1/16*
U.S. Cl. 135—4 R **9 Claims**



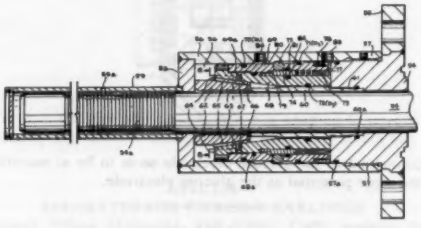
7. A tent frame comprising in combination: a pair of collapsible subframes effective in open position to define a framework capable of supporting a wall covering when stood upon a lower edge, each of said subframes including three or more rigid strut sections and a centrally-located hub-forming connector, said strut sections each being pivotally connected at one end to said connector for hinged movement from a folded position lying alongside one another on the same side of said connector into an unfolded position radiating from the latter in angularly-spaced relation; fastener means hingedly connecting said subframes together at points remote from said lower edges; and, sheet fabric means connecting said lower edges of the subframes together so as to limit the maximum separation therebetween when unfolded, said sheet means also cooperating with the fastener means and with said subframes in open position to define a free-standing structure, and said sheet means further cooperating with said subframes in collapsed condition to envelop same and form a protective covering therefor.

3,941,141

BLOWOUT PREVENTER LOCKING APPARATUS AND METHOD

Eddie L. Robert, 9722 Galston, Spring, Tex. 77373

Filed May 3, 1974, Ser. No. 466,548
Int. Cl.² E21B *33/06*
U.S. Cl. 137—1 **21 Claims**



1. Locking apparatus in combination with a ram type blowout preventer having a housing with a passageway through which a tubular member may pass; ram means movable between a non-sealing position in said housing, in which said passageway is open, and a sealing position in which said passageway is sealingly closed; and operator means for moving said ram means between said non-sealing and sealing positions; said locking apparatus comprising:

a. rod means connected to said operator means reciprocable between first and second terminal positions in response to movement of said ram means between said non-sealing and sealing positions, respectively; and

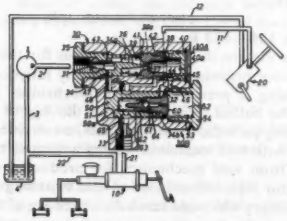
b. locking means comprising slip means non-longitudinally and radially movable from a retracted position, not engaging said rod means, to a contracted position engaging said rod means, when in said second terminal position to lock said ram means in said sealing position, said locking means comprising wedge means engaging said slip means and movable from a first position, holding said slip means in said retracted position, to a second position holding said slip means in said contracted position.

3,941,142

FLOW-DIVIDER VALVE

Yoshiharu Adachi, Toyota, and Uichiro Kobashi, Okazaki, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed May 16, 1974, Ser. No. 470,647
Claims priority, application Japan, May 21, 1973, 48-56452
Int. Cl.² G05D *11/03*
U.S. Cl. 137—101 **4 Claims**



1. A flow-divider valve comprising:

a casing provided with an inlet port connected to a fluid pressure source, a first outlet port connected to a first hydraulic open circuit for a first hydraulically powered device and a second outlet port connected to a second

hydraulic open circuit for a second hydraulically powered device;

a first pressure chamber in open communication with said inlet port and a second pressure chamber in open communication with said first outlet port, a valve body displaceably disposed between said first and second pressure chambers, said first pressure chamber being selectively connected with said second outlet port in response to displacements of said valve body to regulate fluid quantity to be supplied into said second hydraulic open circuit and the communication degree between said second pressure chamber and said first outlet port being regulated in response to the displacements of said valve body to control fluid quantity to be supplied into said first hydraulic open circuit;

variable orifice means in said casing between said first and second pressure chambers to regulate fluid flow from said inlet port toward said second pressure chamber; and

means for controlling the throttling degree of said orifice means in response to pressure independently exerted within said first and second hydraulic open circuits;

whereby the displacements of said valve body are compensated in accordance with the throttling degree of said variable orifice means, said means for controlling the throttling degree of said orifice means including third and fourth pressure chambers which are independently in open communication with the first and second open hydraulic circuits respectively.

3,941,143

AUTOMATIC TRANSMISSION HYDRAULIC CONTROL THROTTLE VALVE

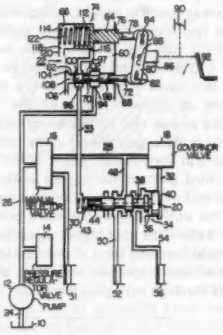
Tetsuya Iijima, Tokyo, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Oct. 3, 1974, Ser. No. 511,689

Claims priority, application Japan, Oct. 6, 1973, 48-111932

Int. Cl.² G05D *7/00*

U.S. Cl. 137—102 **5 Claims**



1. A throttle valve of a hydraulic control system of an automatic power transmission of a vehicle driven by a prime mover, comprising a lever pivotably connected at a first portion with a prime mover acceleration control member, a valve spool pivotably connected with said lever at a second portion which is spaced from said first portion along the length of said lever and having a constant neutral position, a passageway into and from which hydraulic fluid is delivered and discharged to increase and reduce the hydraulic pressure in said passageway when said valve spool is moved from said neutral position in axial, opposite directions, the hydraulic pressure in said passageway being equal to a throttle pressure depending on the position of said control member when said valve spool is in said neutral position, a piston pivotably connected with said lever at a third portion which is spaced from said first and second portions along the length of said lever, a spring urging said piston to prevent said piston from being moved by said lever when said control member is moved in a prime mover output increasing direction, said piston communicating with said passageway and being biased by the hydraulic pressure in said passageway against the action of said spring, said lever being rotatable around said piston by said control member to move said valve spool in said opposite directions when said control member is moved in prime mover output increasing and reducing directions, said piston being moved in response to the hydraulic pressure in said passageway lower and higher than said throttle pressure to move said valve spool from said neutral position in said opposite directions to cause increase and reduction in the hydraulic pressure in said passageway to said throttle pressure.

3,941,144

SUPPLY CIRCUITS FOR FLUIDS UNDER PRESSURE

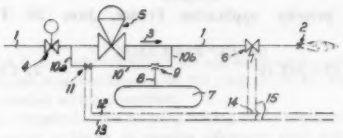
Jean-Philippe Cornil, Houilles, France, assignor to Service National dit: Gaz de France, France

Filed May 14, 1974, Ser. No. 469,768

Claims priority, application France, May 16, 1973, 73.17815; Oct. 11, 1973, 73.36356

Int. Cl.² G05D *16/04*

U.S. Cl. 137—110 **8 Claims**



1. A supply circuit for a gaseous fluid under pressure which comprises a source of gaseous fluid, and a point of consumption of said gaseous fluid, a main pipe between said source of fluid and said point of consumptiion, a regulator and pressure-reducer fitted to said main pipe, at least one obturator fitted to the said main pipe downstream of the said regulator and pressure-reducer, means for minimizing over-pressures resulting from the closing of the said obturator which are caused by the inertia of the regulator, said means being arranged as a by-pass to said main pipe on either side of the regulator and pressure-reducer.

3,941,145

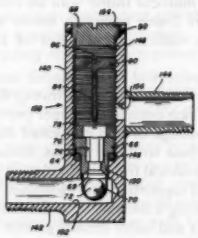
SAFETY VALVE

Eldon W. Morain, and Judson C. Cole, both of Tulsa, Okla., assignors to Continental Industries, Inc., Tulsa, Okla.

Filed Aug. 5, 1974, Ser. No. 494,567

Int. Cl.² F16K *43/00*

U.S. Cl. 137—318 **6 Claims**



1. A safety valve fitting adapted to be interposed between two flow lines comprising:

an upright housing having a top and a bottom, the bottom having communication with one flow line, the housing having a side outlet communicating with the other flow line, the housing having a vertical chamber between the top and bottom, the upper portion of the chamber being internally threaded, the lower portion of the housing having a cavity therein larger in diameter than the chamber;

a maximum flow rate control valve threadably positioned in said chamber, the valve having a valve body and a valve seat therein and a ball supported by a cage below the valve seat, the valve cage extending at least partially within said housing cavity, the position of said cage portion of said valve in said cavity serving to regulate the maximum flow rate before said ball is forced against said seat to close against further flow.

3,941,146

APPARATUS FOR STORING A FLEXIBLE ELONGATED MEMBER, SUCH AS A FLEXIBLE DRILL COLUMN

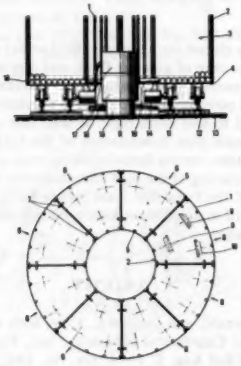
Michel Chatard, Chatou; Pierre Grolet, Orgerus; Remi Reynard, Montesson, and Jean Thiery, Le Pecq, all of France, assignors to Institut Francaise du Petrole, des Carburants et Lubrifiants, France

Continuation-in-part of Ser. No. 264,470, June 20, 1972, Pat. No. 3,804,111. This application Feb. 20, 1974, Ser. No. 444,189

Claims priority, application France, June 29, 1971, 71.23842

Int. Cl.² B65H *15/36*

U.S. Cl. 137—355.16 **25 Claims**



1. An apparatus for storing an elongated flexible element comprising

an inner cylindrical frame with an essentially vertical axis, said inner frame having a radius at least equal to the minimum radius of curvature of an elongated flexible element,

an outer cylindrical frame placed concentric to said first frame, said inner and outer frames defining therebetween a space being open at the upper part thereof so as to allow for the passage of said elongated flexible element,

an annular base structure means, connecting said inner and outer cylindrical frames, for closing the lower part of said space and supporting said elongated flexible element, said space having a dimension in the radial direction between said inner and outer frames greater than the diameter of the cross-section of the elongated element,

guide means cooperaling with the resulting structure of inner and outer frames with said annular base means for guiding in rotation about said vertical axis the resulting structure of inner and outer frames with said annular base means,

drive means coupled to said guide means for driving in rotation said resulting structure about said vertical axis, and

supply means connected to said drive means for supplying power to said drive means,

said annular base structure means being formed of a plurality of separate annular sector members, connecting means interconnecting said annular sectors to one another, and means allowing a displacement of said separate sector members with respect to each other in a direction having at least one vertical component, each of said separate sector members carrying therewith a corresponding portion of said inner and outer frames.

3,941,147

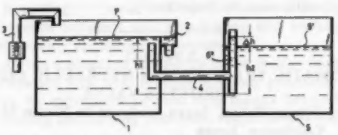
LEVEL CONTROL FOR SURFACE TREATMENT BATHS

Friedel Kaup, Gutersloh, and Heinrich Warnke, Marienfeld, both of Germany, assignors to Miele & Cie, Gutersloh, Germany

Filed Oct. 5, 1973, Ser. No. 403,779

Int. Cl.² E03B *11/00*

U.S. Cl. 137—453 **5 Claims**



1. A level control device for pickling, degreasing, nickel-plating and similar process apparatus having at least two baths of different specific weight in which the bath level of the bath with the higher specific weight is below the bath level of the bath with the lower specific weight, comprising pipe means for connecting the two baths having a first vertical portion positioned in the bath with the lower specific weight and having an upper inlet end positioned directly below the bath level of the bath with the lower specific weight, a second horizontal portion forming an angle of 90° with the first portion and being connected at one end to the lower end of the first portion, and a third portion positioned in the bath with the higher specific weight and forming an angle of 90° with the second portion, said third portion having an outlet end positioned below the inlet end of the first portion and means for adjusting the height of the outlet end of the third portion of said pipe means in the bath with the higher specific weight without movement of said first and second portion so that flow occurs from the bath of lower specific weight to the bath of higher specific weight through said pipe means.

3,941,148

CONTROL VALVE DRIVE

Julius Lerner, Broomall, Pa., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Apr. 17, 1975, Ser. No. 568,966

Int. Cl.² F16K *17/20*

U.S. Cl. 137—486 **3 Claims**

1. An apparatus for automatically controlling a pneumatic valve located in a conduit having fluid flowing inside, and comprising:

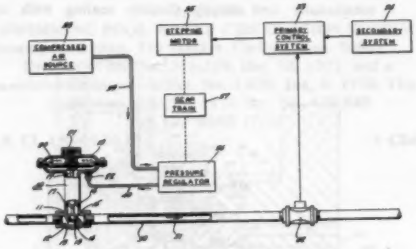
a. pneumatic valving means connected to the conduit;

b. a source of compressed air for actuating the pneumatic valving means;

c. means for measuring the flow rate of fluid in the conduit and for producing a feedback signal indicating the flow rate;

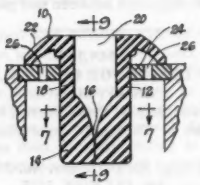
d. means for producing a command signal indicating the flow rate desired in the conduit;

e. means for receiving the command and feedback signals and for producing a control signal to control the valving means; and



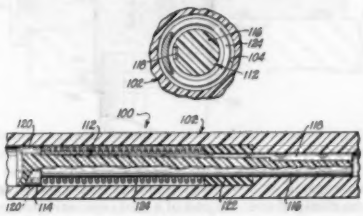
f. means, in communication with the source of compressed air and the valving means, for varying the air pressure supplied to the valving means in response to the control signal produced by the control system.

3,941,149
VALVE
Herbert Mittleman, Deerfield, Ill., assignor to Baxter Laboratories, Inc., Morton Grove, Ill.
Filed Nov. 11, 1974, Ser. No. 522,828
Int. Cl.² F16K *15/14*
U.S. Cl. 137—493.1 **3 Claims**



1. A unitary valve comprising, in combination: a generally cylindrical elongated member defining a central passageway therethrough, said elongated member integrally including an internal duckbill lips configuration with said duckbill lips extending radially inward to normally close said passageway for preventing transfer of fluid in a first direction and said lips being responsive to a predetermined fluid pressure in a second direction to open said passageway, said elongated member having an open bore at one end which open bore extends through a portion of said elongated member toward its opposite end, said elongated member having said duckbill lips closure formed at said opposite end, said elongated member having a substantially greater material thickness at said opposite end than at the portion thereof adjacent said bore, said greater material thickness operating to bias said duckbill lips together to prevent said duckbill from opening in response to a pressure below said predetermined pressure; and an annular umbrella portion integrally extending from said elongated member, normally checking fluid flow generally in said second direction, and flexibly responsive to a predetermined fluid pressure generally in said first direction to allow fluid flow generally in said first direction.

3,941,150
FLOW CONTROL STRUCTURE
Frank R. Anderson, Hacienda Heights, and Albert J. Castro, Cudahy, both of Calif., assignors to Westates Space-Era Products, Inc., S. El Monte, Calif.
Filed May 31, 1974, Ser. No. 474,931
Int. Cl.² F16K *31/363*
U.S. Cl. 137—504 **1 Claim**



1. A flow control structure for use in dispensing a fluid from a conduit in accordance with the pressure of the fluid within the conduit which comprises:

an elongated, rigid housing having an internal cylinder, an outlet cylinder of smaller diameter than said internal cylinder and a shoulder separating said internal and said outlet cylinders, said cylinders being aligned with one another,

a flow control member located within said housing so as to extend from the interior of said internal cylinder past said shoulder into said outlet cylinder, said flow control member including a piston fitting closely within the interior of said internal cylinder and an elongated shank extending from said piston past said shoulder into said outlet cylinder, said shank fitting closely within said outlet cylinder, said flow control being linearly movable within said housing,

a groove means for conveying fluid located within said shank and extending along the length of said shank to the end of said shank remote from said piston, said groove means increasing in total cross-sectional configuration as it extends away from said piston,

a sleeve located around said shank within said outer cylinder and against said shoulder, said sleeve forming a seal against the exterior of said shank and stabilizing said flow control member against other than linear movement,

inlet means on the extremity of said housing remote from said outlet cylinder for retaining said flow control member within said housing, said means comprising a fitting for securing said housing to said conduit,

passage means leading through said piston between the sides thereof,

spring means for biasing said flow control member generally away from said outlet cylinder so that the pressure of fluid entering said inlet means will move the flow control member against the pressure of the spring means in order to achieve flow control regulation in accordance with the pressure of the fluid within the conduit, said spring means comprising a coil spring located around said shank within said internal cylinder and between said sleeve and said piston,

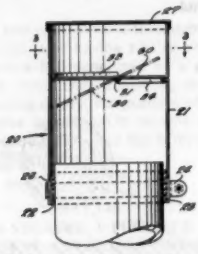
said groove means being shaped so that said structure passes a substantially uniform quantity of fluid regardless of the pressure of the fluid supplied to the inlet of said structure.

3,941,151

VENT PIPE CHECK VALVE

Joseph R. Biddle, 8605 Harry Hines Blvd., Dallas, Tex. 75235

Filed Oct. 7, 1974, Ser. No. 512,522
Int. Cl.² F16K 15/00
U.S. Cl. 137—527.6 9 Claims



1. A vent pipe check valve assembly comprising

an elongated, thin-walled, cylindrical sleeve dimensioned to be clamped over the end of a vent pipe; said sleeve having longitudinal slots opening to its inner end to allow diameter variation at said inner end;

a resilient annular gasket dimensioned for a snug fit within said sleeve slotted end, to provide a seal between said sleeve and a vent pipe;

a thin-walled valve plate mounted on a transverse pivot shaft, with a major portion disposed on one side of said shaft and a minor portion disposed on the other side thereof; said pivot shaft being mounted transversely in said sleeve intermediate its ends, offset from the sleeve axis;

seat means comprising resilient strip members mounted on the inner wall of said sleeve defining a seating plane in which said valve plate substantially closes said sleeve; said seat means comprising a first generally semi-annular member secured to the sleeve wall, for limiting outward swinging of the valve plate major portion, and a second generally semi-annular member secured to the sleeve wall, for limiting inward swinging of the valve plate minor portion;

and means coupled to said valve plate for urging rotation thereof into said seating plane.

3,941,152

DRAINABLE SHUTOFF VALVE WITH FILTER

Irlin H. Botnick, 3155 Kersdale, Pepper Pike, Ohio 44124

Continuation-in-part of Ser. No. 424,898, Dec. 14, 1973, Pat. No. 3,891,001. This application Mar. 18, 1975, Ser. No. 559,582
Int. Cl.² E03B 7/07; F16K 11/06
U.S. Cl. 137—549 22 Claims

1. A shutoff valve comprising:

a hollow valve body having aligned rear and open front operating bore portions separated at inward ends by a centrally apertured partition;

said front bore portion having a smooth region from its open outer end inward to a female-threaded region of reduced diameter to receive a moveable closure serving as a valve operator and the back end of the rear bore being closed, thereby defining a valving chamber partitioned at the inner ends of the aligned bore portions;

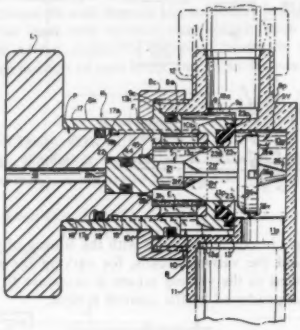
said body having an inlet connection and an outlet connection to inlet and outlet passages opening respectively to the valving chamber on opposite sides of the apertured partition affording a flow path valved at the aperture of said partition;

a valving member guided coaxially of and axially shiftable in the rear bore, between a valve closing location where the valving member seals against said partition to block said aperture, and valve open locations away from the partition;

a valving-member-operating structure inlcuding a valve operator member comprising a rotatable and axially shiftable plug providing said moveable closure and having

an inner male-threaded end engaged in the female threaded region of the front bore portion,

and an unthreaded outer end slidably received in and rotationally and axially slidably sealing with said



smooth end; and means forming an extension from one of, and engageable endwise with the other of, the respective inner ends of said members, whereby said valving member may be displaced from closed position by an advance of said plug into the front bore by plug rotation in one direction, and said plug may be backed out from said front bore after the valving member reaches the closed position during rotation in the other direction; and

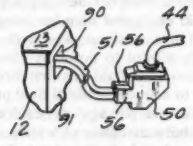
a filter element supported between said plug and aperture.

3,941,153

WATER INLET DEVICE FOR CONTROLLING FLOW TO AN APPLIANCE

John Harry Traube, and R. Bruce Sherer, both of St. Joseph, Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Aug. 30, 1973, Ser. No. 392,857
Int. Cl.² F16K 7/17
U.S. Cl. 137—562 13 Claims



1. An appliance having a cabinet containing a washing chamber, and a water inlet system for connecting the washing chamber to a source of water which is located outside of the cabinet, the water inlet system comprising:

a coupler having seal means for sealingly connecting the coupler to the source of water;

an inlet conduit fluidly connecting the coupler to said washing chamber;

a diaphragm valve means within the coupler for controlling the flow of water from said source through the inlet conduit;

a bleed tube line forming a separate passageway fluidly connecting the diaphragm valve means to the washing chamber; and

a control means in said bleed tube line, said control means being housed within the cabinet and selectively operable to control flow in the bleed tube line to control operation of said diaphragm valve means.

3,941,154

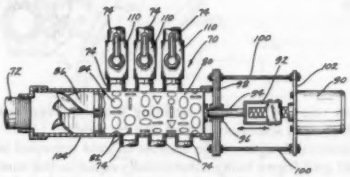
SWIMMING POOL WATER CIRCULATION SYSTEM

Kenneth M. Bishop, 310 Market, Carlisle, Iowa 50047

Division of Ser. No. 316,259, Dec. 18, 1972, and a continuation-in-part of Ser. No. 1,438, Jan. 8, 1970. This application June 17, 1974, Ser. No. 479,840

Int. Cl.² B05B *17/08*

U.S. Cl. 137—624.15 **1 Claim**



1. A control flow valve assembly comprising,

a housing having an inlet opening and a plurality of outlet openings,

a hollow cylindrical valve element in said housing and said inlet opening being in communication with the interior of said hollow cylindrical valve element, said valve element being completely open along its entire axial length,

means for continuously rotating said valve element,

a plurality axially spaced apart rows of peripheral openings in said valve element and a row of openings being successively registrable with each of said outlet openings,

reciprocal power means being provided for moving said valve element longitudinally such that each outlet opening is

alternately aligned with different rows of openings,

said openings in adjacent rows being successively different in shape and size to provide different flow patterns, and

said means for continuously rotating said valve element comprising a vane means being provided at the inlet end of said valve element and connected directly thereto to react with an inlet pressure source to turn said valve element and vane as a unit about a common longitudinal axis.

3,941,155

HYDRAULIC CONTROL VALVE ASSEMBLIES

Glyn Philip Reginald Farr, Kenilworth, England, assignor to Girling Limited, Birmingham, England

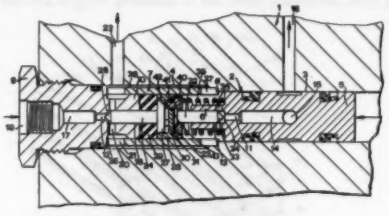
Filed Apr. 23, 1974, Ser. No. 463,241

Claims priority, application United Kingdom, Apr. 24, 1973, 19458/73

Int. Cl.² F15B *13/042*

U.S. Cl. 137—627.5 **10 Claims**

1. A fluid control valve assembly comprising a housing provided with a bore, an inlet port, an outlet port for communication with said inlet port, and an exhaust port for communication with said outlet port, a piston axially movable in said bore between an inoperative retracted position and an operative advanced position, an inlet valve for controlling communication between said inlet port and said outlet port, an exhaust valve for controlling communication between said outlet port and said exhaust port, and a valve-operating assembly common to both valves and having an operative connection with said piston to open said inlet valve while simultaneously closing said exhaust valve and vice versa as said piston is moved between its operative advanced position and its inoperative retracted position, said valve operating assembly including a reversing mechanism comprising a block of resiliently deformable material, means operative in response to movement of said piston in one direction to engage a portion of said block to compress said portion and simultaneously expand a



portion not engaged by said means, and valve operating means connected to one of said valves and having a part engageable by the expanded portion of said block to effect positive movement of the one valve in a direction opposite so that in which said piston is moved axially, said piston, and said inlet and exhaust valves are being aligned axially.

3,941,156

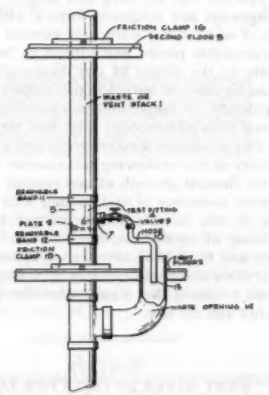
PLUMBING TEST FITTING

Jack D. Metzger, Cleveland, Ohio, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Mar. 24, 1975, Ser. No. 561,032

Int. Cl.² F16L *55/10*

U.S. Cl. 138—90 **2 Claims**



1. A plumbing test fitting for a waste or vent stack extending between next-adjacent floors of a structure, said test fitting comprising:

a length of pipe having an opening in the side wall thereof;

a section of hose;

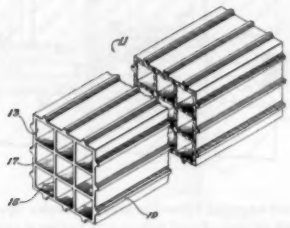
a shut-off valve coupling the hose to the opening in the pipe;

a pair of bands for removably affixing the length of pipe in a waste or vent stack of a structure in a manner whereby the free end of the hose extends into a closet fixture on the lower of next-adjacent floors and a plate affixed to the inside of said length of pipe below said opening thereof and extending across the pipe to block the cross-sectional area thereof.

3,941,157
HIGH STRENGTH MULTIPLE PASSAGEWAY PLASTIC CONDUIT

Louis H. Barnett, 3631 Incanto Drive, Fort Worth, Tex. 76102

Filed July 24, 1974, Ser. No. 491,406
Int. Cl.² F16L 9/18
U.S. Cl. 138—115 9 Claims



1. A corrosion resistant conduit means adapted for being buried underground and the like without crushing comprising:

a. a plurality of interior walls defining a plurality of at least seven longitudinally extending adjacent passageways; at lease one of said passageways being an interior passageway that is completely surrounded by exterior passageways such that all of its walls are precluded from having external cooling by a media exteriorly of said conduit means; said interior walls comprising an extrudable plastic that is substantially uniform in cross sectional texture and density, that is free of any interface and imperfections formed by joining exterior walls, and that is free of an intolerable thermal sag due to sagging of the pliable plastic before it can be cooled;

b. an exterior wall covering said longitudinally extending passageways and integrally formed with the outermost ends of said interior walls; said exterior wall comprising an extrudable plastic and subject to being crushed inwardly by the weight of dirt thereover when not reinforced by ribs and buried in the earth; and

c. a plurality of longitudinally extending ribs integrally formed with said exterior wall; said ribs being external ribs that are disposed exteriorly of said exterior wall; said plurality of ribs reinforcing said exterior wall and increasing the flexural strength of said conduit and the exterior pressure resistance of said conduit such that longer sections of said conduit can be carried and installed for economy of installation; and such that corrosion resistance and large load carrying capability and soil resistance allow said conduit means to be employed in subterranean locations that would otherwise corrode metallic conduit and the like.

3,941,158
WEFT MIXER DEVICES FOR LOOMS

André Joans, Mulhouse, France, assignor to Societe Alsacienne de Constructions Mecaniques de Mulhouse, Mulhouse Cedex, France

Filed Dec. 10, 1974, Ser. No. 531,338
Claims priority, application France, Dec. 17, 1973, 73.45005
Int. Cl.² D03D 47/00, 47/38
U.S. Cl. 139—122 W 4 Claims

1. Weft mixer device for looms which includes a frame and at least one weft-inserting member, said device comprising

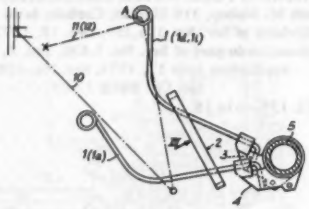
a. a plurality of selection fingers each adapted selectively to occupy an active position in which it supports a weft yarn in the path of a weft inserting member and in inactive position in which it supports a weft yarn outside of said path;

b. a vertical shaft supported by the loom frame;

c. means mounting said selection fingers on said shaft for swinging movement about the axis of said shaft, said selection fingers being articulated about an axis at right angles to the axis of said shaft; and

d. a grid including a frame having two opposed sides of unequal lengths and bars movably mounted in said grid frame and extending between said opposed sides, adjacent ones of said bars defining therebetween spaces in which said selection fingers can be guided;

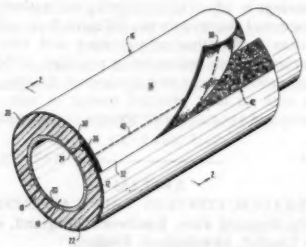
the internal length of the shorter of said opposed sides of said grid frame being substantially equal to the sum of the thicknesses of said bars and of the thickness of a single said selection finger, and the internal length of the longer of said opposed sides of said grid frame being at least equal to the sum of the thicknesses of all the bars and of all the selection fingers.



3,941,159
INSULATION ASSEMBLY FOR A TUBULAR CONDUIT PIPE

Wolcott Toll, R.D. 3 Pocono Road, Newtown, Conn. 06470

Filed Oct. 31, 1974, Ser. No. 519,649
Int. Cl.² F16L 9/14; B65D 65/08; A44B 13/00; B32B 7/08
U.S. Cl. 138—147 2 Claims



1. An insulation assembly for a tubular conduit pipe having an outer surface, the insulation assembly comprising:

a length of compressible insulation material having inside and outside surfaces and having first and second side edges;

a layer of moisture and vapor impervious fabric co-extensive in length with the length of compressible insulation material, the fabric having inner and outer surfaces;

the layer of fabric being of a width exceeding that of the insulation material;

the layer of fabric having an interior end coincident with the first side edge of the insulation material, and having an exterior end which extends outwardly of the second side edge of the insulation material;

a strip of fastening material having a series of minute hook-like projections thereon fixedly secured to the inner surface of the fabric on said interior end thereof;

a strip of hirsute material fixedly secured to the outer surface of the fabric on said interior end thereof; and

the inside surface of the insulation material contacting the outer surface of the conduit pipe and being of a width from side-to-side such that its respective edges contact one another and the strips of fastening material and hirsute material being radially aligned when the edges are in contact, said strips being adherent to one another.

3,941,160

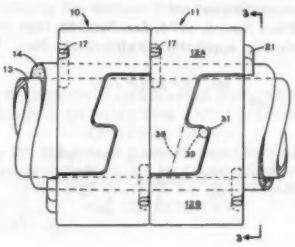
INTERLOCKING CERAMIC TILE FOR COVERING AN INSULATED WATER COOLED PIPE STRUCTURE

Frank Campbell, Jr., North Augusta, S.C., assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed Feb. 8, 1974, Ser. No. 440,900

Int. Cl.² F16L *9/10, 9/22*

U.S. Cl. 138—178 **4 Claims**



1. A preburned ceramic refractory shape formed as a segment of ring-like configuration having substantially parallel edge surfaces, one of the edge surfaces having an arcuate protuberance thereon and the opposite edge surface having an annular recess therein symmetrically arranged with respect to the protuberance, a semi-cylindrical inner surface substantially perpendicular to the edge surfaces and having parallel arms extending beyond and with their inner surfaces merging with the inner surface of the shape, an external segment of a cylindrical surface co-axial with and spaced outwardly of the inner semi-cylindrical surface and the surface extended to define an exterior surface of the arms, one of the edge surfaces of the shape being substantially flat throughout its extent including the arms, the other edge surface having symmetrical recessed portions including each arm extending through the shape, each recessed portion including a hook therein, some of the surfaces of the recessed portion lying in radial planes passing through a common axis of the inner and outer curved surfaces.

3,941,161

JACQUARD REVERSING MECHANISM FOR LOOMS

Rene Neyraud, Saint-Cyr, Au Mont D'or, France, assignor to Verdol S.A., Caluire, France

Filed Sept. 20, 1974, Ser. No. 507,905

Int. Cl.² D03C *3/32*

U.S. Cl. 139—1 E **11 Claims**

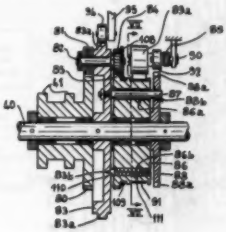
1. In a loom Jacquard of the Verdol type associated with a loom and including a pusher grid driven by a cam system the operative position of which in the cycle of operation of the Jacquard should be displaced when the direction of rotation of said Jacquard is reversed, a mechanism comprising:

a frame;

a driving shaft rotatably supported by said frame and adapted to be connected with the loom to rotate in synchronism therewith in one or the other direction when said loom is running forward or backward, with said pusher grid driving cam system being rotatably carried by said shaft;

means to retain said pusher grid driving cam system at a first angular position on said shaft when the shaft rotates in one direction and at a second angular position on said shaft when the shaft rotates in the other direction;

means actuated by said shaft to angularly displace said pusher grid driving cam system from one of said first and second angular positions to the other whenever, after said



shaft has rotated in one direction, it is started in the other direction;

and means to inhibit the action of said cam system displacing means during the portion of the operative cycle of the Jacquard wherein displacement of said pusher grid driving cam system would be liable to damage parts of the Jacquard.

3,941,162

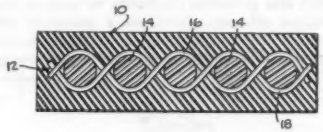
REINFORCING FABRIC FOR BELTS

James L. McCabe, Winnsboro, and William D. Loeble, Columbia, both of S.C., assignors to Uniroyal Inc., New York, N.Y.

Filed Mar. 28, 1974, Ser. No. 455,708

Int. Cl.² D03D *15/00*

U.S. Cl. 139—383 R **10 Claims**



1. A fabric comprising closely spaced and parallel warp cords, and weft cords interlaced with and extending transversely of said warp cords to retain the latter in parallel relation, said warp cords being constituted of synthetic spun yarn having no greater than two single ends plied together and an equivalent cotton count of 1.0.

3,941,163

METHOD OF MAKING A WOVEN ZIPPER

Friedrich Glindmeyer, Stolberg; Wilhelm Friedrich Hennenberg, Alsdorf, and Karl Limpens, Stolberg, all of Germany, assignors to William Prym-Werke KG, Stolberg, Rhineland, Germany

Filed June 28, 1974, Ser. No. 484,031

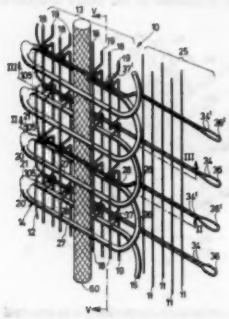
Claims priority, application Germany, June 29, 1973, 2333152

Int. Cl.² D03D *47/00*

U.S. Cl. 139—384 B **7 Claims**

1. A method of making a woven zipper, comprising the steps of weaving a zipper tape from warp threads and weft threads; during weaving of said zipper tape alternately opening and closing a shed composed of cover warp threads which extend longitudinally of said warp threads; advancing in a path extending in longitudinal direction of said weft threads a coil-forming filament which in the region of said shed additionally

performs a movement about an imaginary conical surface which surrounds said path; moving said cover warp threads to the exterior vicinity of said imaginary conical surface and holding them in position until said filament has moved past them along said imaginary conical surface; shifting said cover



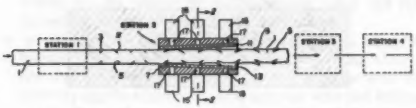
warp threads through said imaginary conical surface inwardly thereof after said filament has moved past them; and inserting a binding thread transverse to said cover warp threads into a subsequently formed shed which is located in a plane behind some of said cover warp threads.

3,941,164

PROCESS FOR MAKING BARBED MATERIAL

Daniel D. Musgrave, 8201 Caraway St., Cabin John, Md. 20731

Filed Feb. 13, 1975, Ser. No. 549,680
Int. Cl.² B21F *25/00*
U.S. Cl. 140—58 12 Claims



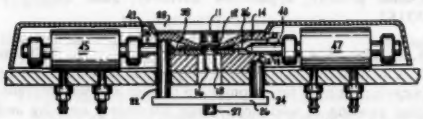
1. A process for making barbed material comprising: forming a slit intersecting an edge of a flat piece of magnetic material at an acute angle with said edge; and bending a portion defined by said slit and said edge out from said material by tractive magnetic means.

3,941,165

WIRE LEAD STRAIGHTENING DEVICE

James E. Bowden, Mountain View, and Robert H. Kesterson, Sunnyvale, both of Calif., assignors to Richard P. Wheat, Los Altos, Calif.

Filed Feb. 13, 1975, Ser. No. 549,752
Int. Cl.² B21F *1/02*
U.S. Cl. 140—147 12 Claims



1. An apparatus for straightening a multiplicity of ductile wire leads extending from a base comprising,

a vertically movable holder for holding said base,

laterally movable die hook means for engaging a number of said wire leads,

first motive means connected to said die hook means for radially inwardly moving said hook means and then outwardly moving said hook means to a withdrawn position corresponding to a wire lead straightening position relative to said base,

second motive means connected to said base for vertically moving said base away from said die hook means, thereby pulling the wire leads attached to the base through the die hook means at the withdrawn position of said hook means, and

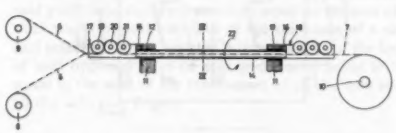
means for actuating said first and second motive means.

3,941,166

MACHINE FOR ALTERNATE TWISTING OF WIRE OR CABLE

Henri Maillefer, Cossonay, Switzerland, assignor to Maillefer S.A., Ecublens, Switzerland

Filed Nov. 5, 1974, Ser. No. 521,155
Claims priority, application Switzerland, Nov. 7, 1973, 15626/73
Int. Cl.² B21F *7/00*
U.S. Cl. 140—149 9 Claims



1. Apparatus for alternate twisting of metal wire or cable; comprising:

a frame;

a linear storage unit comprising a straight cable-supporting tube through which said wire or cable passes,, said tube mounted to said frame for rotation about its longitudinal axis;

first and second twisting means mounted to said frame at and coupled to exterior opposite ends of said tube, said wire or cable passing through said first twisting means prior to entering said linear storage unit and through said second twisting means after exiting from said linear storage unit; and

means for rotating said storage unit and said twisting means alternately in opposite directions about the longitudinal axis of siad cable-supporting tube such that said tube rotates in the same direction as and at a speed which is not less than the speed of rotation of said twisting means.

3,941,167

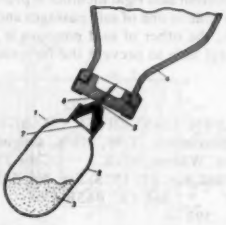
ADMIXTURE AND PROCESS FOR THE PRODUCTION OF SOLUTIONS FOR INFUSIONS

Ingeborg Maria Haury-Wirtz, Schildgen; Lothar Otto Barensfeld, Bergisch Gladbach, and George Edgar Callahan, Dusseldorf, all of Germany, assignors to Compaselect GmbH, Zug, Switzerland

Filed Jan. 2, 1974, Ser. No. 430,155
Claims priority, application Switzerland, Jan. 3, 1973, 3573/73
Int. Cl.² B65B *3/04*
U.S. Cl. 141—1 R 11 Claims

1.In a method of preparing a ready-for-use bottle of infusion or rinsing solution in which the solution is prepared for use by adding at least one additive to a previously prepared bottle of infusion or rinsiing solution, the improvement comprising providing the additive in powder or paste form in a quantity adapted to the quantity of the solution in said bottle and having a quality adapted for compatability with the solution in said bottle in a variable volume container, the volume of said variable volume container being larger than that occupied by

the additive in said variable volume container, and adding said additive to said bottle by introducing a portion of the solution from said bottle into said variable volume container, mixing

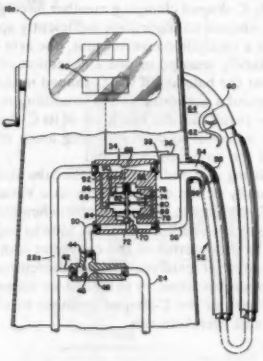


the additive and solution in said variable volume container and introducing the mixture from said variable volume container into said bottle.

3,941,168
LIQUID DISPENSING AND VAPOR RECOVERY SYSTEM UTILIZING AN INJECTOR AND A VAPOR FLOW CONTROL VALVE

Trueman W. Hiller, and Klaus D. Jarr, both of Bettendorf, Iowa, assignors to Weil-McLain Company, Inc., Dallas, Tex.

Filed Dec. 19, 1974, Ser. No. 534,448
Int. Cl.² B67D *5/04*
U.S. Cl. 141—46 **10 Claims**

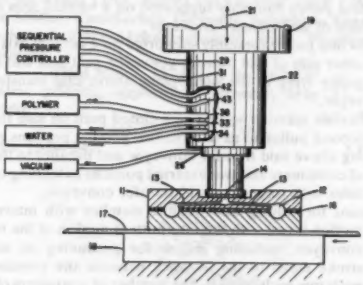


1. A liquid dispensing and vapor recovery system comprising storage means for said liquid, first conduit means adapted to connect said storage means to a receptacle, pump means for pumping said liquid from said storage means through said first conduit means and to said receptacle, second conduit means connected to said first conduit means and to said storage means for diverting a portion of said liquid in said first conduit means back to said storage means, means for forming a reduced pressure zone in said second conduit means in response to liquid flow through said second conduit means, third conduit means connected to said second conduit means at said reduced pressure zone and to said receptacle for drawing the vapors from said receptacle into said second conduit means for passage into said storage means, and valve means disposed in said third conduit means for continuously changing the flow rate of vapor through said third conduit means in proportion to changes in the flow rate of liquid through said first conduit means.

3,941,169
MOLD INJECTION ADAPTER FOR LOW VISCOSITY POLYMERS

Giovanni Bassani, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Dec. 30, 1974, Ser. No. 537,289
Int. Cl.² B65B *31/06*
U.S. Cl. 141—61 **7 Claims**



1. An adapter for injection of low viscosity polymeric material into a mold cavity comprising:

a housing having sealing means at an exit portion thereof for effectuating an air tight seal between said exit portion and a mold portion surrounding an injection port to the cavity of said mold,

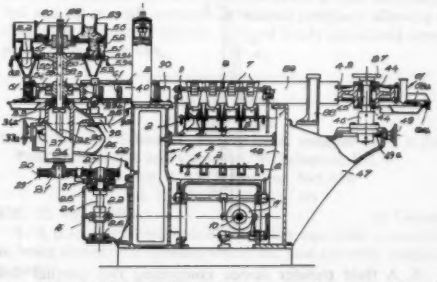
evacuation means in said housing for effecting evacuation of the mold cavity when said sealing means is positioned in sealing contact with said mold, and

injection means in said housing for selectively injecting said polymeric material into the injection port of said mold cavity while the cavity is in evacuated condition; said injection means including a flow control valve at the exit portion of said housing and a first fluid operated piston in said housing for selectively operating said valve and further including a selectively operable isolation means surrounding the injection port and carried by the housing for preventing back flow of polymeric material into said evacuation means.

3,941,170
FEEDER FOR PACKAGING

Maurizio Maulini, Bologna, Italy, assignor to Azionaria Costruzioni Macchine Automatiche A.C.M.A. S.p.A., Bologna, Italy

Filed Dec. 26, 1973, Ser. No. 428,580
Claims priority, application Italy, Dec. 29, 1972, 3656/72
Int. Cl.² B65B *43/42*
U.S. Cl. 141—183 **6 Claims**



1. A feeder for simultaneously discharging a plurality of batches of fluent powdery or granular material into containers having an upper opening, comprising:

a transfer conveyor,

means for supporting said containers on said transfer conveyor in parallel rows perpendicular to the direction of travel of said transfer conveyor, said rows being equally spaced relative to each other, the containers in each row being equally spaced from one another,

means for moving said transfer conveyor with intermittent motion with an advancing pitch equal to, or a multiple of, the spacing between two adjacent rows of containers,

a first pulley rotatably supported on a vertical axis on one side of said transfer conveyor,

a second pulley rotatably supported on a vertical axis on the other side of said transfer conveyor, said first and second pulley lying in the same plane above said transfer conveyor,

a flexible member wound in a closed path on said first and second pulley so as to have two parallel portions extending above said transfer conveyor and parallel to the rows of containers and two external portions extending on both sides with respect to said transfer conveyor,

means for driving said flexible member with intermittent motion timed with the intermittent motion of the transfer conveyor, including means for producing an advance stroke equal to the distance between the containers of each row multiplied by the number of containers of a row and a dwell period,

a plurality of upwardly open receptacles disposed on said flexible member and spaced at distances equal to the spacing of the containers of each row, said receptacles having lower discharge openings and said receptacles being arranged on said flexible member so that said lower discharge openings along said parallel portions of said flexible member are in alignment with the upper openings of the containers,

means for dispensing batches of material into those receptacles which are arranged on the external portions of the flexible member,

doors supported on said receptacles for closing said lower discharge openings, and

control means for operating said doors in timed relationship with said flexible member driving means, said control means opening said doors in response to said flexible member and said transfer conveyor being in the dwell period, during which dwell period the lower discharge openings of said receptacles are disposed above the upper openings of the containers.

3,941,171

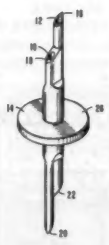
FLUID TRANSFER DEVICE

Robert W. Ogle, Newport Beach, Calif., assignor to IMS Limited, S. El Monte, Calif.

Filed July 5, 1973, Ser. No. 376,588

Int. Cl.² B67C *3/02*

U.S. Cl. 141—309 **3 Claims**



1. A fluid transfer device comprising two parallel fluid passages within a single elongated rigid member having open cutting ends, said rigid member being carried by a generally disk-like flange disposed midway between the ends of said rigid member which is generally perpendicular to said passages, the improvement wherein said passages are of equal length and the two open ends of said passages on each side of said flanges are longitudinally displaced from one another, and further wherein said rigid member is provided with at least one lateral air hole in one of said passages and, on the opposite of said flange, the other of said passages is provided with at least one lateral hole to prevent the formation of fluid slug.

3,941,172

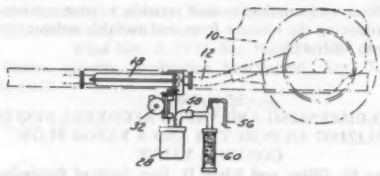
CATALYTIC CONVERTER CHANGER DEVICE

David L. De Martelaere, Troy, Mich., assignor to Kent-Moore Corporation, Warren, Mich.

Filed Jan. 15, 1975, Ser. No. 541,265

Int. Cl.² B65B *1/04*

U.S. Cl. 141—392 **15 Claims**



1. A catalytic converter changer device for emptying or filling a catalytic converter unit with catalytic pellets and comprising, in combination:

a tube composed of rigid material and forming a catalytic pellet conveying conduit;

a generally C-shaped clamping member having the two arms of its C-shaped configuration sufficiently spaced apart to straddle a catalytic converter unit, one arm of its C-shape being fixedly secured to one end section of the tube and such that the balance of the C-shaped member is extendable around a converter unit in straddling relation thereto with the result that the two arms of its C-shape configuration lie adjacent to corresponding areas of the opposite sides of the converter unit; and

a sleeve fitting said end section of the tube and being adjustable axially of the tube to serve as a variable extension thereof, said sleeve being operable when axially extended relative to the end section of the tube to engage the lip of a port to the interior of the converter unit to serve as a conveyance of catalytic pellets therethrough and also being operable when so extended to cooperate with the second arm of the C-shaped member to clamp the converter unit therebetween.

3,941,173

APPARATUS FOR MACHINING THE EDGES OF PANELS, ESPECIALLY PANELS OF WOOD MATERIAL HAVING HARD GLUE LAYERS THEREON

Eberhard Heimbrand, Horb, and Peter Bok, Glatt, both of Germany, assignors to Ledermann & Co., Germany

Filed Mar. 27, 1974, Ser. No. 455,289

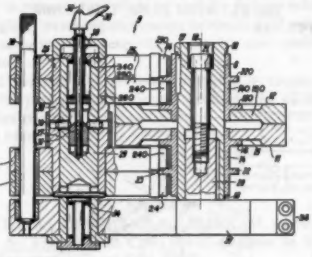
Claims priority, application Germany, Mar. 29, 1973, 2315719

Int. Cl.² B27C *1/00*

U.S. Cl. 144—114 R **9 Claims**

1. An apparatus for machining the edges of panels, especially the edges of wood-like material having at least one layer of synthetic material glued thereon; rotary tool means having peripheral cutting means thereon for cutting engagement with the edge of a panel, a spindle for rotatably supporting said rotary tool means, slide means reciprocable on the spindle and connected to the tool means, and adjustable means engaging said slide means and operable to adjust said slide means axially on said spindle during rotation of said tool means, said adjust-

able means also being operable to retain said slide means in adjusted positions on said spindle, said tool means comprising a pair of tools in side by side relation, said slide means comprising a sleeve for each tool, each sleeve being fixed to the



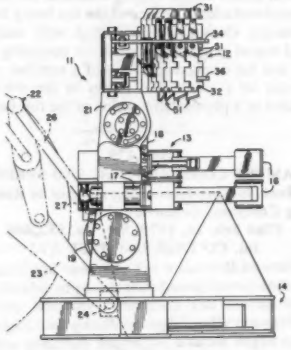
respective tool and reciprocable on the said spindle, said sleeves being adjustable on said spindle in respectively opposite directions and the said cutting means on each said tool overlapping those on the other tool when the tools are viewed in the circumferential direction.

3,941,174

DEBARKING ASSEMBLY FOR TREE HARVESTERS

Dorrance Oldenburg, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 18, 1975, Ser. No. 550,331
Int. Cl.² A01G 23/08
U.S. Cl. 144—208 J 18 Claims



1. In a tree harvester assembly for mounting on a vehicle, the tree harvester assembly including an elongated frame, drive means arranged upon the frame for gripping and axially moving a tree along a processing path and delimbing means arranged for engagement with the tree as it is moved along its processing path by the drive means, the delimbing means including a plurality of delimbing blades and mounting means for selectively moving the delimbing blades into engagement with substantially the entire circumference of the tree, the delimbing blades being arranged for facing engagement with the tree as it is moved along its processing path, the improvement comprising

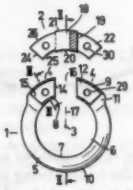
a debarking blade means associated with each of the delimbing blades and arranged for engagement with the tree subsequent to engagement of the tree with the respective delimbing blade, and means for resiliently mounting each debarking blade relative to the respective delimbing blade, each debarking blade being arranged in generally perpendicular relation to the tree axis with the resilient mounting tending to maintain intimate debarking engagement between the respective debarking blades and the tree.

3,941,175

CONNECTING LINK, ESPECIALLY FOR TIRE CHAINS

Anton Müller, Unterkochen, Germany, assignor to Eisen- und Drahtwerk Erlau Aktiengesellschaft, Aalen, Wurttemberg, Germany

Filed May 7, 1974, Ser. No. 467,727
Claims priority, application Germany, May 17, 1973, 2325004
Int. Cl.² B60C 27/04
U.S. Cl. 152—242 3 Claims



1. A composite connecting link for a tire chain made of two parts fixed together in which the complete link has a substantially smooth, continuously curved interior periphery, said link on each side being tangent about its circumference to a plane perpendicular to the axis of said link so that said link is of uniform axial thickness throughout its entire length, the first part of said link extending about a major portion of the circumference of said link and having a gap for receiving the ends of adjacent tire chain links, the second part having a section to fit in said gap between the ends of said first part and being symmetrical about an axial plane through its center, the ends of said two parts having complementary, interfitting ends, each end on one part having a pair of axially spaced legs having a total axial thickness of the thickness of said link, and forming a slot between said legs, the sides of said slot lying in planes perpendicular to the axis, each of the complementary ends of the other part having a projection formed with flat sides lying in planes perpendicular to the axis to fit between the flat sides of said slot, the ends of said second part having end surfaces at an angle to an axial plane and complementary surfaces on the first part to be engaged by the end surfaces on said second part and limit movement of said second part inwardly of said first part, and means through the interfitting ends of said parts to secure said parts together to form a complete ring, the uniform axial thickness of said composite link and the smooth, continuous internal periphery allowing a chain link connected thereto to move freely about said composite connecting link.

3,941,176

SAFETY TIRE

Harold Gordon Schwartz, Akron, Ohio, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 4, 1975, Ser. No. 565,080
Int. Cl.² B60C 17/00, 5/06
U.S. Cl. 152—340 26 Claims

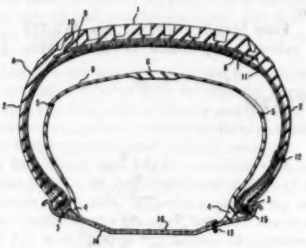
1. A pneumatic automotive safety tire assembly adaptable to being seated on a standard wheel rim, said assembly consisting of:

a. a nonporous, fiber-reinforced casing having a tread, sidewalls, and beads, and

b. a toroidally shaped inner chamber located within said casing and having no fabric reinforcement; the size of said

chamber being more than 50% of the volume within the casing, when each is inflated to an operating pressure of about 24–30 psig;

said inner chamber being constructed of a thermoplastic elastomer selected from copolyetheresters and polyurethanes which exhibit a strain of not more than 10% subjected to a tensile stress of 300 psi for 1 minute at 91°C. and not more than 15% for 100 minutes at 91°C., the



thickness of the inner chamber adjacent the sidewall and tread areas of the casing being such that the vector sum of the principal strains of the chamber in those areas at an inflation pressure of 24 psig is not greater than 10%, and the maximum creep at 24 psig at a temperature of 91°C. after 100 minutes is 5%;

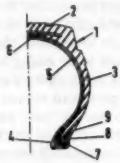
said casing and inner chamber being inflatable through separate valves.

3,941,177

PNEUMATIC TIRES

Ryozo Okada; Munenori Iuchi, and Munemitsu Yamada, all of Toyota, Japan, assignors to Dunlop Limited, London, England

Filed May 2, 1974, Ser. No. 466,465
Int. Cl.² B60C *15/04*
U.S. Cl. 152—362 R **5 Claims**



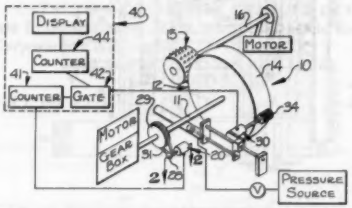
1. A pneumatic tire comprising at least one carcass ply of steel cord fabric, the cords of the ply being disposed substantially radially of the tire, two bead regions each having a bead core around which is turned an end of the carcass ply to terminate axially outwardly thereof, and a chafer strip disposed in each bead region adjacent to and axially outwardly of the ply turned up edge, the chafer strip comprising a strip of steel cord fabric less rigid than the fabric of the carcass ply, and said strip being of a doubled construction having a folded portion lying substantially midway between edge portions of the strip, the folded portion of the chafer strip being disposed radially outward of the two edges of the strip and being positioned to extend substantially alongside the turned-up edge of the carcass ply and provide support to said turned up edge during flexing of the tire in use.

3,941,178

APPARATUS AND METHOD FOR DISPLAYING THE MEASUREMENT OF A TIRE

John R. Simpson, Charlotte, and Robert E. Lozier, Jr., Monroe, both of N.C., assignors to El-Trol, Inc., Charlotte, N.C.

Filed Apr. 19, 1974, Ser. No. 462,404
Int. Cl.² B29H *21/08*; G06M *3/00*
U.S. Cl. 157—13 **11 Claims**



1. In an apparatus for preparing a previously used pneumatic rubber tire for retreading and having

driven shaft means for mounting a tire and for rotating the tire during removal of rubber therefrom, and

means mounted in spaced relation to said shaft means for engaging a peripheral crown surface of a tire mounted thereon and for removing rubber therefrom during rotation of the tire,

an arrangement for measuring a physical dimension of a tire during removal of rubber therefrom and comprising:

first signal generating means for generating a train of electrical pulses characterizing the rotational speed of the tire being buffed,

second signal generating means for generating a train of electrical pulses characterizing the linear surface speed of the peripheral crown surface of the tire being buffed, and

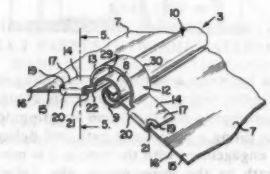
circuit means electrically connected with said first and second signal generating means for receiving said pulse trains and for displaying a ratio of a number of pulses in one train to a number of pulses in the other train as indicative of a physical dimension of the tire being buffed.

3,941,179

DAMPER CONSTRUCTION AND SPRING

James R. Root, Independence, Mo., assignor to Ruskin Manufacturing Company, Grandview, Mo.

Filed Feb. 24, 1975, Ser. No. 552,440
Int. Cl.² E06B *3/48*; E05F *1/12*
U.S. Cl. 160—84 R **9 Claims**



1. In a closure comprising a plurality of elongated blades, each blade being hingedly connected along a marginal edge to the adjacent blade for swinging movement between a folded position lying generally along said adjacent blade, to an unfolded position disposed generally in extension of said adjacent blade, spring means for urging a pair of said blades into said unfolded position, said spring means comprising:

a. a spring member having an arcuate central portion with arm structures extending therefrom, each arm structure being generally flat and extending normally in the oppo-

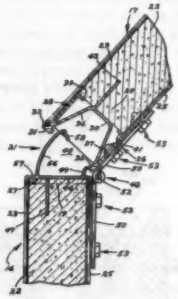
site direction from the other arm structure with the arcuate portion being generally coaxial of a hinge connection of said pair of blades and spaced outwardly thereof and each arm structure being in overlying engagement with outer side surfaces of its corresponding blade of its pair and having means removably and frictionally engaging said corresponding blade in radially spaced relation from an axis of swinging movement between said pair of blades for securing the respective arm to said corresponding blade;

b. said arcuate central portion being a torsion element whereby contracting thereof upon folding of said pair of blades biases said arm structures in directions to return said blades to said unfolded position.

3,941,180
SECTIONAL DOOR AND GUARD RAIL ASSEMBLY

Timothy N. Thill, Forest City, Iowa, assignor to Winnebago Industries, Inc., Forest City, Iowa

Filed Dec. 30, 1974, Ser. No. 537,257
Int. Cl.² E05D *15/38*
U.S. Cl. 160—229 R **16 Claims**

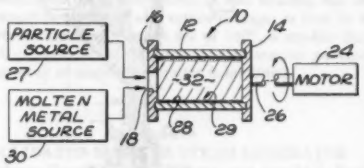


1. A guard rail assembly for a sectional door of the type having a pluraltiy of panels with facing lateral ends of adjacent panels being hingedly connected and having interior and exterior edges, said panels being hingedly connected for relative rotation generally about the interior edges of the facing lateral ends between an aligned position and a rotated position, said guard rail assembly comprising: a first rail mounted to a lateral end of a first panel; a second rail mounted to a lateral end of a second panel adjacent the first panel facing the lateral end of the first panel; said first rail having front wall means extending from the exterior edge of the lateral end of the first panel and terminating in a front foot; said first rail having a pocket behind said front wall means openly facing said second rail; said pocket having a bottom area and a top area; said second rail having an arcuate segment extending to the bottom area of said pocket when the first and second panels are in the aligned position and extending into the top area of said pocket when the first and second panels are in the rotated position whereby the arcuate segment spans the gap between the lateral end of the second panel and the front foot of the front wall means of the first rail, said arcuate segment having an outside wall located adjacent the front foot when the panels are in either the aligned or rotated positions.

3,941,181
PROCESS FOR CASTING FACED OBJECTS USING CENTRIFUGAL TECHNIQUES

Charles A. Stoody, Fullerton, Calif., assignor to Stoody Company, Santa Fe Springs, Calif.

Continuation-in-part of Ser. No. 254,295, May 17, 1972, abandoned. This application Aug. 5, 1974, Ser. No. 494,695
Int. Cl.² B22D *19/06*
U.S. Cl. 164—59 **11 Claims**



1. A process for producing hard-faced metal roller structures, comprising the steps of:

providing a mold defining a cylindrical internal support surface that is definitive of the external configuration for one of said roller structures;

rotating said mold to develop centrifugal forces toward said internal support surface thereof, adequate to position dense particles thereon;

loosely distributing tungsten carbide particles of at least twenty mesh size on said support surface whereby said centrifugal forces hold said particles for retention at said support surface;

injecting molten metal into said mold, said molten metal being less dense than said particles and at a temperature below the melting temperature of said particles whereby said particles tend to remain positioned contiguous to said surface as a result of said centrifugal forces; and

rotating said mold containing said particles and said molten metal at a speed in excess of 1000 revolutions per minute to develop said centrifugal forces such that said lessdense molten metal moves about said particles and solidifies in contact therewith, to provide a solid roller structure faced with said particles.

3,941,182
CONTINUOUS PROCESS FOR PREPARING UNIDIRECTIONALLY REINFORCED METAL FOAM

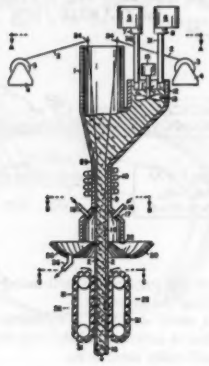
Johan Bjorksten, Madison, and Edward J. Rock, Blue Mounds, both of Wis.

Continuation of Ser. No. 193,744, Oct. 29, 1971, abandoned. This application July 31, 1973, Ser. No. 384,295
Int. Cl. B22d *11/06*
U.S. Cl. 164—86 **2 Claims**

1. The process of providing a longitudinally elongated body of metal foam having longitudinally extending wires therewithin, said wires being of metal melting higher than the metal of the foam, comprising the combination of the steps of:

1. intensively mixing into molten metal to be foamed a substance which decomposes and liberates gas when heated, and
2. heating said substance to decompose it while it is immersed in said molten metal to produce molten metal foam with heat by conduction from said molten metal,
3. moving said molten metal foam longitudinally to provide a longitudinally moving body of molten metal foam,
4. providing said longitudinally moving body of molten metal foam between a plurality of longitudinally moving surfaces of endless metal belts contacting said longitudinally moving body of molten metal foam,
5. providing a plurality of metal wires of metal melting higher than the metal of said foam, said wires having surfaces disposed to adhere to the metal of said foam.

6. moving said wires longitudinally to introduce said wires longitudinally into said longitudinally moving body of molten metal foam with said wires moving longitudinally at the same longitudinal rate as the rate of longitudinal



movement of said longitudinally moving body of molten metal foam,

7. cooling said longitudinally moving body of metal foam containing said wires to provide said longitudinally elongated body.

3,941,183

LIQUID COOLED ELECTROMAGNETIC CONTINUOUS CASTING MOLD

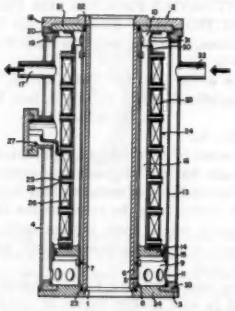
Louis Vedda, Metz, and Alain Leclercq, Gargenville, both of France, assignors to Institut de Recherches de la Siderurgie Francaise (IRSID), Saint-Germain-en-Laye, France

Filed Oct. 18, 1974, Ser. No. 515,925

Claims priority, application France, Oct. 19, 1973, 73.37514

Int. Cl.[2] B22D *11/04, 27/02*

U.S. Cl. 164—147 **2 Claims**



1. In a mold for the continuous casting of molten metal, which comprises a tubular mold element having two open ends and defining a passage for the casting between the open ends, a casing surrounding the tubular mold element and defining therewith an annular enclosed space, and an electromagnetic inductor means arranged in the annular enclosed space for moving the molten metal in the passage, the inductor means and the tubular mold element defining an annular gap therebetween, the improvement of

1. a tubular jacket mounted in the annular gap, the jacket defining
   a. an inner annular space with the tubular mold element, the inner annular space being laterally confined by the mold element and the jacket for cooling the mold element, and
   b. an outer annular space with the inductor means, the outer annular space being laterally confined by the jacket and the inductor means for cooling the inductor means; and
2. an annular liquid-tight element at one end of the annular enclosed space and arranged between the jacket and the casing to separate the enclosed space into an inlet chamber for a liquid cooling medium and an outlet chamber for the liquid cooling medium,
   a. the inductor means being mounted in the outlet chamber; and
   b. the inner annular cooling space being in communication with the inlet chamber at one end of the jacket and with the outlet chamber at the other end thereof.

3,941,184

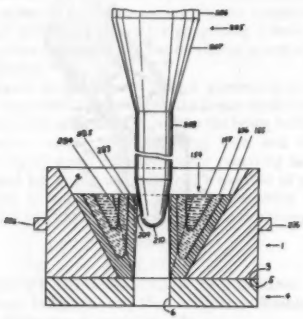
APPARATUS FOR MANUFACTURING SEAMLESS METAL TUBULAR PRODUCTS

John W. Kelso, 315 Euclid Ave., Dravosburg, Pa. 15034

Filed Jan. 10, 1974, Ser. No. 432,194

Int. Cl.[2] B22D *11/124*

U.S. Cl. 164—270 **14 Claims**

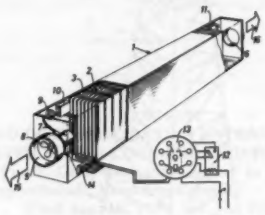


1. An apparatus for making a billet for a seamless tube rotary rolling mill, comprising a plurality of open-topped molds, upstanding cores removably mounted in said molds, a metal casting station, a core removing station, a forging station including a mandrel shaped to enter core holes formed by removal of said cores in castings in said molds, a mold stripping station, and means for successively moving each of said molds passed said stations, said molds having casting cavity side walls each in the form of an inverted frustrum of a cone and stools forming their cavity bottoms and in which holes are formed and in which said cores are fitted to mount the cores, said mold moving means supporting said stools and providing clearance therebelow for downward movement of said cores, and a hammer mounted above said molds at said core removing station for hammering said cores downwardly through castings formed in said mold cavities, said cores being tubular, and including nozzles inserted in the tops of said cores of said molds, means for moving each of said nozzles with each of said molds, means for automatically inserting said nozzles in said cores of said molds leaving said casting station one after another, means for automatically removing said nozzles from said cores as said molds approach said core removing station and means for supplying said nozzles with water while inserted in said cores.

3,941,185
HEAT ACCUMULATOR

Erik E. Henning, Harrhagsvagen 65, S-122 40 Enskede, Sweden

Filed Jan. 15, 1975, Ser. No. 541,245
Claims priority, application Sweden, Jan. 21, 1974, 7400735
Int. Cl.² F28D *17/00*
U.S. Cl. 165—4 **4 Claims**

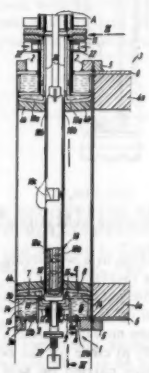


1. A device for ventilating spaces such as dwelling rooms, workmens barracks, cold storage and freeze spaces and the like, which device includes a fan located in a housing provided with two sockets positioned at a distance to each other, means for reversing the direction of said for, characterized in that the housing, apart from the fan, comprises a package positioned between the sockets, heat holdover means including several plates provided at a distance to each other, elongated narrow channels being defined between the plates, whereby inlet or outlet air passes through these channels and thereby gives off heat or cold to the plates while the air after exchange of the directions of rotation of the fan passes in the opposite direction through the channels picks up the heat and the cold, respectively, stored in the plates and returns it to the ventilated space.

3,941,186
WATER-COOLED HIGH-TEMPERATURE SLIDE VALVE, ESPECIALLY HOT BLAST SLIDE VALVE

Heinz Schneider, Duren-Lendersdorf, Germany, assignor to Zimmermann & Jansen GmbH, Duren, Germany

Filed May 29, 1974, Ser. No. 474,432
Int. Cl.² F28F *19/00*
U.S. Cl. 165—47 **9 Claims**

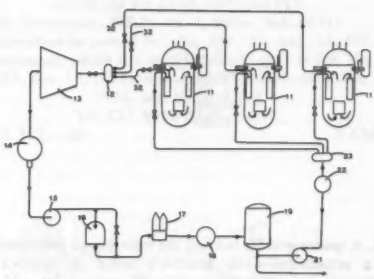


1. In a water-cooled high-temperature slide valve comprising a housing, a valve plate mounted movably within said housing, annular coolant passages extending from the upper portion of said housing along both peripheral sides thereof to the lower portion of the housing, a coolant return passage being provided within said housing radially outwardly of said annular passages in communication therewith and extending about the peripheral edge of said valve plate at least in the lower portion thereof, the improvement comprising at least one transfer port in the lower portion of each of said annular passages for transferring coolant from said annular passages into said return passage, the axial extent of said return passage being defined by radially extending side wall members spaced axially inwardly of the opposed ends of said housing and the cross-sectional flow area of said return passage, at least in its lower portion extending over an arc of 180°, is smaller than the overall cross-sectional flow area of said annular passages whereby settling of suspended matter is inhibited.

3,941,187
CONSOLIDATED NUCLEAR STEAM GENERATOR

Felix S. Jabsen; Donald C. Schluderberg, and Arnold E. Paulson, all of Lynchburg, Va., assignors to The Babcock & Wilcox Company, New York, N.Y.

Continuation-in-part of Ser. No. 162,359, July 14, 1971, abandoned. This application Jan. 29, 1973, Ser. No. 327,349
Int. Cl. F28d *7/00;* **F28f** *9/16*
U.S. Cl. 165—157 **5 Claims**



1. In a nuclear power generating system having separate flow paths for a primary and a secondary fluids the improvement comprising a plurality of modular heat exchanger units, each of said units having a steam header and a feedwater header spaced from each other, a pair of tube sheets spaced from each other and joined to individual headers to form a feedwater inlet chamber and a steam discharge chamber with said respective headers, a feedwater tube passing through said steam discharge chamber tube sheet and attached to said feedwater inlet tube sheet to establish fluid communication with said feedwater inlet chamber, a plurality of tubes establishing fluid communication between said feedwater inlet chamber and said steam discharge chamber, a concentrically disposed shroud that is spaced outwardly from said communicating feedwater tube, said shroud having ends received in said tube sheets, the primary and secondary flow paths being countercurrent relative to each other, each of said tubes in said plurality of tubes terminating in two ends, each of said ends being secured to a respective one of said tube sheets, a nuclear reactor pressure vessel enclosing said plurality of modular heat exchangers, and a feedwater inlet manifold penetrating said pressure vessel, said feedwater manifold being in fluid communication with more than one of said modular heat exchanger units through individual conduits to allow for thermal expansion and contraction of said units.

3,941,188

TUBE SPACER GRID FOR A HEAT-EXCHANGER TUBE BUNDLE

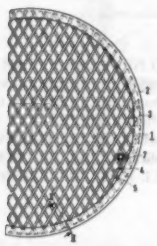
Helmut Scheidl, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

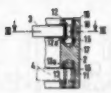
Filed Mar. 13, 1974, Ser. No. 450,880

Claims priority, application Germany, Mar. 30, 1973, 2316133

Int. Cl.² F28F 9/00

U.S. Cl. 165—162 5 Claims





1. A spacer grid for holding the interspaced individual tubes of a pressurized-water reactor's steam generator's heat-exchanger tube bundle, comprising an annular grid frame having an inner surface in which an annular groove is formed, a series of mutually interspaced grid bars each having opposite end portions which are interspaced and inserted in said groove, said frame having ends and having axially extending interspaced holes formed through at least one of said ends and through said groove, said holes being formed between said end portions, and cylindrical sections inserted through said holes and holding said end portions interspaced in said groove.

3,941,189

SUBSURFACE WELLHEAD SHIELD

Robert M. Peevey, Carriere, Miss., assignor to Standard Oil Company, Chicago, Ill.

Filed Nov. 18, 1974, Ser. No. 525,041

Int. Cl.² E21B 7/12

U.S. Cl. 166—.5 4 Claims

1. A marine installation for producing fluids from an underground reservoir beneath the bottom of a body of water which comprises;

a deck;

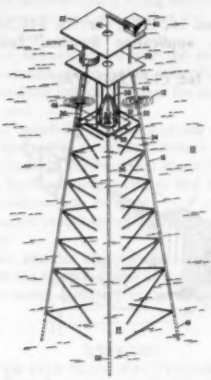
non-buoyant support means supporting said deck above said body of water;

a wellhead base supported by said support means beneath said deck below the surface of said body of water and above said bottom;

a wellhead supported on said wellhead base;

a producing line from said wellhead to said deck;

a portable shield for placing over said wellhead, said shield including a framework extending horizontally and vertically over the wellhead to protect it from falling debris



and to permit water to flow by said wellhead; and

a flowline from said wellhead to said underground reservoir.

3,941,190

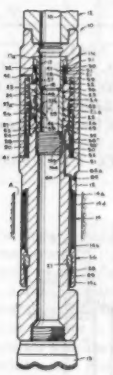
WELL CONTROL APPARATUS

George E. Conover, deceased, late of Houston, Tex. (by Charlotte Conover, executrix), assignor to Lynes, Inc., Houston, Tex.

Filed Nov. 18, 1974, Ser. No. 524,760

Int. Cl.² E21B 33/127

U.S. Cl. 166—187 31 Claims



1. Apparatus for controlling wells during drilling operations comprising:

a. a body for connection in a well string, said body having a longitudinal bore therethrough;

b. reinforced inflatable packer means carried by said body for inflation to seal off the well bore;

c. bore close off means movable through the well string for seating in said body to close off the bore therethrough;

d. control valve means carried on said body and having means responsive to well bore pressure and pressure in the drill string whereby said control valve is movable in one direction in response to increasing pressure differential between the drill string above said bore close off means when seated and the well bore above said packer

means to communicate said packer means with a drill string for inflation of said packer means and movable in the opposite direction in response to decreasing pressure differential between the drill string above said bore close off means when seated and the well bore above said inflated packer means to communicate said packer means with the well bore for deflation therefor; and

e. latch means for latching said bore close off means in position in the well string.

3,941,191

METHOD OF CONSOLIDATING UNCONSOLIDATED OR INSUFFICIENTLY CONSOLIDATED FORMATIONS

Gunter Pusch, Celle, Germany, assignor to Deutsche Texaco Aktiengesellschaft, Hamburg, Germany

Filed Aug. 16, 1974, Ser. No. 497,995

Claims priority, application Germany, Aug. 25, 1973, 2343021

Int. Cl.² E21B *43/24*

U.S. Cl. 166—288 **25 Claims**

1. A method for consolidating an unconsolidated oil-bearing formation containing residual oil and penetrated by a wellbore comprising the steps of:

a. injecting via said wellbore into said formation a combustion promoter comprising a mixture of a combustion initiator and an activator, wherein at least one activator is selected from the group consisting of vanadium oxychloride, iron sulfate and nickel chloride,

b. injecting via said wellbore an after-wash fluid to insure the permeability of said formation,

c. injecting via said wellbore an oxidizing material to effect oxidation of said mixture and residual oil and thereby consolidating said formation adjacent said wellbore.

14. A method for consolidating an unconsolidated oil-bearing formation containing residual oil and penetrated by a wellbore comprising the steps of:

a. injecting via said wellbore into said formation a combustion promoter comprising at least one autooxidizing material selected from the group consisting of indene, fluorene, 1,2-dihydronaphthalene, 9,10-dihydroanthracene and mixtures thereof,

b. injecting via said wellbore an after-wash fluid to insure the permeability of said formation,

c. injecting via said wellbore an oxidizing material to effect oxidation of said mixture and said residual oil and thereby consolidating said formation adjacent said wellbore.

3,941,192

METHOD FOR RECOVERING HIGH ASPHALTENE CONTENT PETROLEUM USING SURFACTANTS

Joseph T. Carlin, and Ricardo L. Cardenas, both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

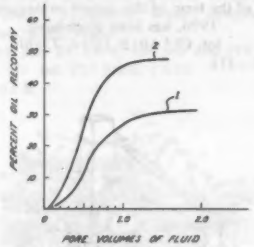
Filed Aug. 26, 1974, Ser. No. 500,232

Int. Cl.² E21B *43/00, 43/16*

U.S. Cl. 166—304 **12 Claims**

1. A method of recovering asphaltic petroleum from a subterranean formation wherein an aqueous surfactant solution is injected into the formation, the improvement for increasing the oil recovery efficiency which comprises,

contacting the asphaltic petroleum prior to injecting the surfactant solution or simultaneously therewith with an aqueous solution containing a solvent for petroleum which has a solubility of from about 0.01 to about 10% by weight in fresh water at 75°F., and which has a solubility



in the asphaltic petroleum substantially greater than the solubility in water.

3,941,193

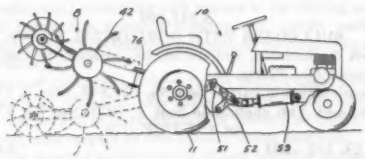
GROUND TILLING APPARATUS

Paul W. Shoemaker, R.F.D. No. 1, Berne, Ind. 46711

Continuation-in-part of Ser. No. 389,191, Aug. 17, 1973, abandoned, which is a continuation-in-part of Ser. No. 208,081, Dec. 15, 1971, abandoned. This application Oct. 10, 1974, Ser. No. 513,732

Int. Cl.² A01B *33/02, 31/10*

U.S. Cl. 172—106 **6 Claims**



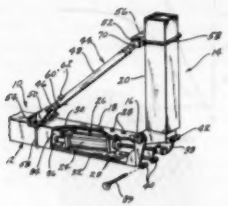
1. Tilling apparatus comprising a supporting frame adapted to be coupled to a tractor having a drive axle, a tiller shaft journaled on said frame for rotation about an axis parallel with and spaced from said drive axle, said tiller shaft having fixedly secured thereto a plurality of circumferentially spaced-apart, radially extending, ground penetrating tines, each said tine having a pointed tip and a shank portion intermediate said shaft and tip, means drivingly coupling said tractor to said tiller shaft for rotating the tiller shaft in the same direction as and at a predetermined speed ratio with respect to said axle, said ratio being selected so that an imaginary circle concentric with said tiller shaft and defined by points on said shank portions rotates at a circumferential speed substantially equal to the ground speed of said tractor whereby said tips generate a curtate cycloidal curve as said tines rotate and said tiller shaft is moved forwardly, each of said tines being smoothly curved from its tip toward said shaft forwardly in the direction of rotation thereof generally along a true arc which approximates the segment of said curtate cycloidal curve generated as its tip enters the ground whereby said tips pierce the ground by curtate cycloidal movement with the respective shank portions following in the holes formed by the tips.

3,941,194

FOLDING TOOL BAR HAVING A TRANSPORT BRACE

Henry K. Orthman, Lexington, Nebr., assignor to Orthman Manufacturing, Inc., Lexington, Nebr.

Continuation-in-part of Ser. No. 100,910, Dec. 23, 1970, Pat. No. 3,774,693. This application Oct. 3, 1973, Ser. No. 403,284
The portion of the term of this patent subsequent to Nov. 27, 1990, has been disclaimed.
Int. Cl.² A01B *15/14, 73/00*
U.S. Cl. 172—311 13 Claims



11. An agricultural implement comprising,

a tool bar including a main frame and at least one wing section, said wing section being pivotally movable between raised and lowered positions,

a hinge pivotally interconnecting said wing section and said main frame,

said main frame having an elongated passageway in its end adjacent said wing section,

a hydraulic cylinder connected at one end to said main frame and positioned in said passageway and pivotally connected at its opposite end to said wing section at a point remote from the pivotal axis of said hinge, and

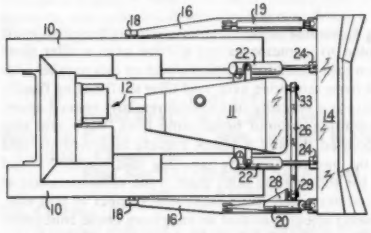
said wing section including an ear connected to said cylinder and said ear extends into said passageway in said main frame when said wing section is in said lowered position.

3,941,195

BULLDOZER WITH HORIZONTAL BRACE

Robert N. Stedman, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Continuation-in-part of Ser. No. 727,548, May 8, 1968, abandoned. This application Sept. 1, 1971, Ser. No. 176,916
Int. Cl.² E02F *3/76*
U.S. Cl. 172—801 4 Claims



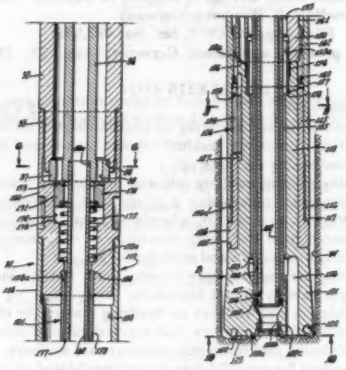
1. A tractor having a main frame, a bulldozer assembly comprising forwardly extending independent push arms pivotally mounted at first and second sides of said tractor and a bulldozer blade directly attached to forward ends of said push arms and positioned closely adjacent to a forward end of said tractor to extend transversely thereof, and bracing means interconnecting said main frame and said bulldozer assembly for resisting relative lateral movement therebetween consisting of a single rigid link universally connected to said frame and to said blade and located between the forward end of said tractor and said blade, said link extending transversely of said tractor and in at least substantial parallel relationship with respect to said blade.

3,941,196

PERCUSSIVE AIR HAMMER AND CORE BIT APPARATUS

Alfred R. Curington, and Theodore J. Roscoe, Jr., both of Houston, Tex., assignors to Bakerdrill, Inc., Spartanburg, S.C.

Division of Ser. No. 392,628, Aug. 29, 1973, Pat. No. 3,871,486. This application Oct. 24, 1974, Ser. No. 517,540
Int. Cl.² E21B *1/06, 3/12, 5/00*
U.S. Cl. 175—100 19 Claims



1. An airhammer for use in applying successive percussive blows to a percussive drill bit for taking core sample material from the bottom end of a bore hole while drilling the bore hole, said airhammer including a housing, an airhammer piston reciprocable in said housing, valve means for alternately directing air to opposite ends of said airhammer piston and exhausting air therefrom, a core tube extending longitudinally and centrally through said housing and said airhammer piston, first means for conducting exhaust air from the interior of said housing to the exterior of said housing, and second means separate from said first means for conducting a portion of the air supplied to said airhammer directly to the interior of said core tube to convey core material upwardly therethrough.

3,941,197

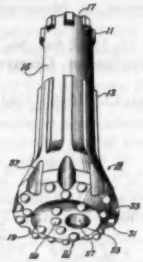
ROTARY PERCUSSION EARTH BORING BIT

Leon B. Stinson, Houston, Tex., assignor to Hughes Tool Company, Houston, Tex.

Filed July 1, 1974, Ser. No. 484,837
Int. Cl.² E21C *13/06*
U.S. Cl. 175—400 3 Claims

1. An improved geometric configuration for a rotary-percussion earth boring bit that includes a body having torque transmission means on an upper region, an anvil upper surface and an enlarged lower region with a transverse face containing button type inserts, the improvement comprising the formation of the body of a single mass of metal, a single cylindrical air course extending without deflection or intermediate inter-

section from a central portion of the anvil surface into intersection with an offset portion of the transverse face, and at



least one insert positioned in the face adjacent said air course and the axis of rotation of the bit.

3,941,198
DETACHABLE POWER UNIT FOR A GOLF BAG CART
Chris S. Kappas, 218 - 13th St., Racine, Wis. 53403
Filed Aug. 29, 1974, Ser. No. 501,635
Int. Cl.² B60K *1/04*; B62D *51/04*
U.S. Cl. 180—11 **7 Claims**

1. In combination, a golf cart having a handle and a pair of laterally spaced-apart ground engaging wheels; and a detachable power unit for said golf cart comprising:

an attaching frame;

first pivotal attachment means at one end of said attaching frame for detachably connecting said attaching frame to said golf cart and to enable relative pivotal movement between said attaching frame and said golf cart about a horizontal axis;

a driving frame;

second pivotal attachment means at an opposite end of said attaching frame for detachably connecting said driving frame to said attaching frame and to enable relative pivotal movement between said driving frame and said attaching frame about a vertical axis, said second pivotal attachment means comprising a sleeve and a shaft and electrically non-conductive bearing means between said sleeve and said shaft to electrically insulate said attaching frame from said driving frame;

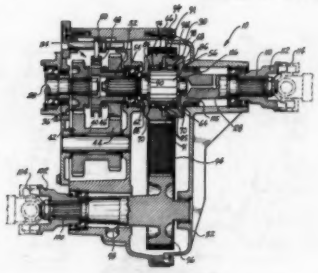
an electrical battery rigidly and stationarily mounted on said attaching frame between said ends;

a ground wheel journalled for rotation on said driving frame rearwardly of said second pivotal attachment means, said driving frame being swingably mounted on said bearing means about said vertical axis to provide a castering effect for said wheel as said golf cart and power unit are steered by said handle;

an electric motor carried on said driving frame;

and drive means on said driving frame connecting said motor and said wheels.

3,941,199
POWER TRANSMISSION FOR A VEHICLE
Richard D. Williams, Vancouver, Wash., assignor to Warn Industries, Inc., Kent, Wash.
Filed July 22, 1974, Ser. No. 490,510
Int. Cl.² B60K *17/34*
U.S. Cl. 180—44 R **34 Claims**



1. In a ground traveling vehicle having a forward and rearward set of wheels and an engine to drive said wheels, a four wheel drive power transmission apparatus comprising;

a. a housing having a front end and rear end,

b. an inner driving member rotatably mounted in said housing about a longitudinal axis and adapted to be connected to a power output from the vehicle engine, said driving member having radially outwardly facing, longitudinally aligned, driving cam surfaces,

c. a first forward set and a second rear set of wedging clutch elements mounted around said driving member for circumferential movement with respect to the driving member between a released position and driven position where the clutch elements are engaged by the driving cam surfaces,

d. a pair of cylindrical, longitudinally aligned cages holding the clutch elements, said cages engaging each other to permit limited relative rotation of the sets of clutch elements with respect to one another about said axis,

e. a first forward outer annular driven member having an interior generally cylindrical surface surrounding said first set of wedging clutch elements and arranged to engage said first set of wedging clutch elements in driving relationship with said driving member and to disengage from said first set of wedging clutch elements in overrunning relationship with said driving member,

f. a first power output means mounted to said first driven member and adapted to be connected to power transmitting means extending laterally therefrom and forwardly to connect to the forward set of wheels of the vehicle, with said first power output means having journal bearing means for said first power output means arranged to withstand laterally directed force loads from said laterally extending power transmitting means,

g. a second rearward outer annular driven member having an interior generally cylindrical surface surrounding said second set of wedging clutch elements and arranged to engage said second set of wedging clutch elements in driving relationship with said driving member and to disengage from said second set of wedging clutch elements in overrunning relationship with said driving member, and

h. a second power output means mounted to said second driven member and adapted to engage a rearwardly ex-

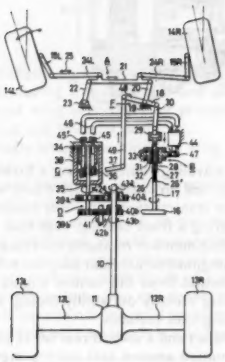
tending power transmitting means connected to the rearward set of wheels of the vehicle.

3,941,200

STEERING MEANS WITH POSITIVE STEERAGE FOR AUTOMOBILES

Tousuke Kawada, 10, Kamieblike, Hitotsugicho, Kariya, Aichi, Japan

Filed July 25, 1974, Ser. No. 491,708
Claims priority, application Japan, July 27, 1973, 48-85202
Int. Cl.[2] B62D 5/06
U.S. Cl. 180—79.2 R 7 Claims



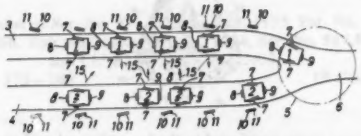
1. In an automobile having steered wheels engaged with a handle or steering wheel through an interconnecting mechanism so as to be deflected by operating the handle, a steering means comprising a differential mechanism having an output and two inputs independent of each other, said differential mechanism being interposed in said interconnecting mechanism, a deflection-detecting mechanism having an angle lever actuated by said interconnecting mechanism to detect the deflection of the steered wheels relative to the longitudinal direction of the body of the automobile, a speed-detecting mechanism to detect the running speed of the automobile regardless of the forward and the backward movement of the automobile, a transducing mechanism as a control system having two inputs and an output, one of said inputs being connected with said deflection-detecting mechanism, the other with said speed-detecting mechanism, indication of the rotational angle of said handle being supplied to one of the inputs of said differential mechanism and the output of said transducing mechanism being supplied to the other input of said differential mechanism to control the deflection of the steered wheels, and the steered wheels being returned to in the longitudinal direction of the body of the automobile by the output of said differential mechanism with a positive correlation such that the control speed of the deflection to its setpoint increases with the increasing output of said transducing mechanism in response to the increasing speed of the automobile and without any operation to return the handle after the steered wheels are deflected by operating the handle.

3,941,201

TRAFFIC MERGING METHOD AND MEANS

Walter Hermann, Weissenfeld, and Peter Kraus, Munich, both of Germany, assignors to Messerschmitt-Bolkow-Blohm GmbH, Germany

Filed July 25, 1973, Ser. No. 382,553
Claims priority, application Germany, Aug. 1, 1972, 2237763
Int. Cl.[2] B60L 15/40
U.S. Cl. 180—98 4 Claims



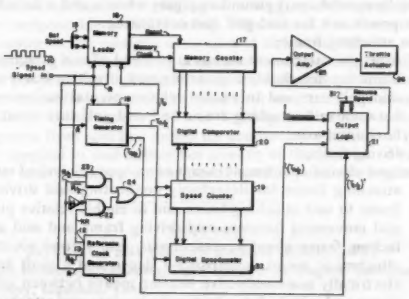
1. The method of merging vehicles, travelling single file in each of two separate lanes, into a single lane, comprising electronically operating the vehicles in each lane to establish minimum gaps between each vehicle and the vehicle immediately ahead in the same lane, electronically changing the operation of the vehicles as the vehicles approach the merge point to form additional gaps, filling the additional gaps of one lane with the vehicles of the other lane at the merge point, the step of changing the operation including forming a signal representative of each vehicle of one lane in the other lane in a predetermined range approaching the merge point and varying the speed of each of the vehicles as if each signal formed by a vehicle just closer to the merge point or equidistant to the merge point, were a vehicle directly ahead, the step of electronically controlling the speed of the vehicle including maintaining the speed of the vehicles in one lane until it receives signals that it is too close behind another vehicle in its lane or to form an additional gap.

3,941,202

DIGITAL SPEED CONTROL

Morris Sorkin, Santa Monica, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Apr. 30, 1970, Ser. No. 33,186
Int. Cl. B60k 31/00; G05d 13/00
U.S. Cl. 180—105 E 10 Claims



1. A digital speed control for maintaining a motor vehicle at a preselected speed comprising:

means for generating a first digital signal responsive to the actual speed of the vehicle;

means for producing and storing a first digital number proportional to a preselected vehicle speed;

means for generating a first digital reference clock pulse train;

means for generating a second digital reference clock pulse train;

first digital counter means clocked by said first digital signal responsive to the actual speed of the vehicle for a first portion of the period of said first reference clock pulse train, said first digital counter means being further clocked by said second reference clock pulse train for the remainder of said first reference clock pulse period;

a digital comparator producing a digital error signal which rises to and remains at a preselected potential whenever the output of said first digital counter equals said first digital number proportional to said selected vehicle speed; and

means for adjusting the speed of the vehicle in response to said digital error signal to maintain the preselected speed.

3,941,203
ANTI-SPINNING DEVICE FOR AUTOMOBILES

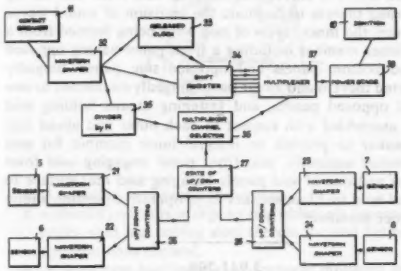
Gilles Leconte, Boulogne-Billancourt, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed June 26, 1974, Ser. No. 483,450

Claims priority, application France, July 24, 1973, 73.27108

Int. Cl.² F02P 9/00; B60K 26/02

U.S. Cl. 180—105 E **6 Claims**



1. An anti-spin device for a motor vehicle having driven and non-driven wheels and an ignition system including a contact breaker producing an original breaker signal, said device comprising a sensor for at least one driven wheel and a sensor for at least one non-driven wheel, each of said sensors producing electrical pulses proportional in number to the peripheral distance covered by said wheel, the sensor of said driven wheel generating a lower number of pulses than the sensor of the non-driven wheel for a same peripheral distance covered thereby, at least one up/down counter, said driven wheel pulses being received at the up input of said counter and said non-driven wheel pulses being received at the down input of said counter, a shift register receiving said original breaker signal, a clock released by said original signal and controlling said shift register to produce a plurality of sequentially increasing retarded breaker signals at respective outputs, a multiplexer having a plurality of channels connected to said shift register outputs respectively and an output connected to the remainder of said ignition system, and a channel selector circuit controlled by said counter either to select said original breaker signal for said multiplexer output when said up counted pulses do not exceed said down counted pulses by more than a predetermined amount or to select one of said retarded breaker signals when said up counted pulses exceed said down counted pulses by more than said predetermined amount, the retarded breaker signal selected being dependent on the amount of excess whereby the engine torque and therefore said spin is reduced.

3,941,204
ENGINE AUTOMATIC CONTROL SYSTEM FOR VEHICLES

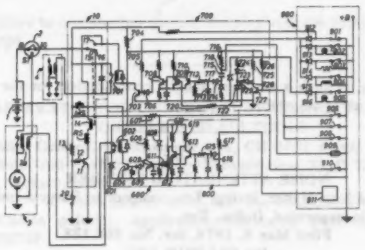
Masaaki Kurii; Kiyoshi Kobari, both of Kasugai, and Osamu Yanagi, Tokai, all of Japan, assignors to Nippondenson Co., Ltd., Kariya; Toyota Jidosha Hanbai Kabushiki Kaisha, Nagoya and Kabushiki Kaisha Tokai Rika Denki Seisakusho, Nishikasugai, all of, Japan

Filed Sept. 25, 1974, Ser. No. 509,230

Claims priority, application Japan, Oct. 8, 1973, 48-117928[U]

Int. Cl.² B60K 28/00

U.S. Cl. 180—111 **5 Claims**



1. In an engine automatic control system for a vehicle having an ignition switch for selectively connecting an electric source with an engine starter and an engine ignition circuit comprising switch means to be closed by disengaging operation of clutch means of the vehicle, a starter energizing circuit for connecting said electric source with said starter in response to the closing operation of said switch means, a starter cut-off circuit for detecting the start of engine rotation caused by said starter and cutting off current supply to said starter, speed sensing means for detecting the speed of the vehicle, and an engine control circuit controlled by said speed sensing means for maintaining said engine ignition circuit conductive while the vehicle runs and for making said ignition circuit non-conductive when the vehicle is arrested,

the improvement comprising setting means interposed between said ignition switch and said ignition circuit for selectively disconnecting said ignition circuit from said ignition switch and setting said engine control system to its operative condition and cancelling means coupled with said setting means for automatically cancelling the operative condition of said engine control system when an operator leaves the vehicle.

3,941,205
METHOD AND MEANS FOR CONTROLLING THE AIR PRESSURE IN A SOUND-PROOFED HANGAR FOR TESTING JET ENGINES

Oskar Gerber, Krailling, Germany, and Karl Göesta Agmén, Eskilstuna, Sweden, assignors to Granges Nyby AB, Sweden

Filed June 25, 1974, Ser. No. 483,042

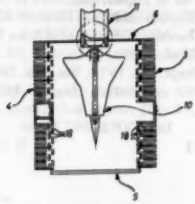
Claims priority, application Germany, May 7, 1974, 2422025

Int. Cl.² E04H 6/44; F02K 1/26

U.S. Cl. 181—33 HB **38 Claims**

1. A sound-proofed hangar for testing jet engines, the hangar rear wall being provided with an exhaust gas silencer through which the exhaust gas jet of at least one jet engine is conducted into the atmosphere, at least a part of the other walls consisting of sound-absorbing sections, characterized in that screens are provided for varying the flow resistance or the free flow cross-section of the area difference between the inlet cross-section of the exhaust gas silencer and the exhaust jet cross-section, said screens having different diameters at the axially opposite openings thereof with the smaller diameter

being located closer to the thrust pipe opening of the jet engine and that the soundabsorbing sections are movably



arranged in such a manner that the cross-section for the inflowing air is adjustable.

3,941,206

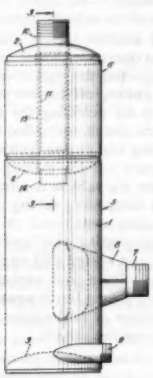
NOISE ATTENUATING SNUBBER

Edmund John Halter, Irving, Tex., assignor to Burgess Industries Incorporated, Dallas, Tex.

Filed May 8, 1974, Ser. No. 468,188

Int. Cl.² F01N *1/10*

U.S. Cl. 181—50 **5 Claims**



1. In a noise attenuating snubber including means forming an elongated enclosure having an inlet and an outlet, a gas flow tube arranged lengthwise within said enclosure for the passage of a pulsating gas stream therethrough, said tube having perforations therein throughout substantially the entire length thereof and extending from the outlet end toward but stopping short of the inlet end of said enclosure to provide a gap opening to extending from said inlet to said outlet of said enclosure and between said enclosure and an acoustic surge chamber said tube, the improvement which comprises the provision of acoustically penetrable media arranged within and filling the surge chamber, said chamber being closed except for the perforations in the flow tube and the gap opening thereinto, the arrangement being such that the portion of the gases of the pulses which expand into the surge chamber through said gap flow into or through said media before discharge from the snubber.

3,941,207

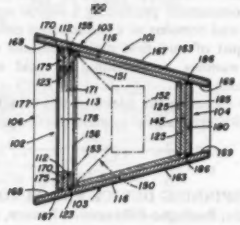
LOUDSPEAKER ASSEMBLY

Robert E. Croup, Indianapolis, Ind., assignor to Acoustic Fiber Sound Systems, Inc., Indianapolis, Ind.

Filed Aug. 26, 1974, Ser. No. 500,597

Int. Cl.² H05K *5/00*; A47B *81/06*

U.S. Cl. 181—199 **21 Claims**



1. A loudspeaker assembly comprising a loudspeaker including a front mounting flange having front surfaces lying in a common plane and including a rear surface spaced from said front surfaces, and an enclosure for said loudspeaker including a front wall and a rear wall and a top wall and a bottom wall and opposed side walls, each of said walls including at least two layers of corrugated material, said front wall having an opening therein to facilitate the emission of sound waves therefrom, the inner layers of said walls being formed from a single inner member including a front panel having opposed top and bottom panels and opposed side panels hingedly connected thereto and a rear panel hingedly connected to one of said opposed panels, and fastening means holding said panels assembled with respect to each other and about said loudspeaker to provide an integral inner member for said loudspeaker assembly, said front panel engaging said front surfaces and one of said panels engaging said rear surface to trap and hold said loudspeaker in its operative position within said inner member.

3,941,208

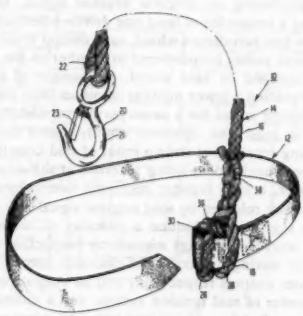
SAFETY BELT CONSTRUCTION

Dennis St. Germain, 3350 Bancroft Drive, Aston, Pa. 19014

Filed Nov. 29, 1974, Ser. No. 528,086

Int. Cl.² A62B *35/00*

U.S. Cl. 182—3 **7 Claims**



1. A safety belt construction including:

A. a belt adapted to be positioned about the body of a wearer, said belt having opposed ends;

B. a flexible buckle attached to said belt adjacent one of said opposed ends and including a passageway through which the other of said opposed ends is inserted to adjust the belt to a desired closed condition about the body of

the wearer, said buckle including means for retaining said belt in its adjusted, closed condition; and

C. a safety line forming a unitary extension of said buckle and adapted to be secured through a connector to suitable anchorage in a structure being worked upon.

3,941,209

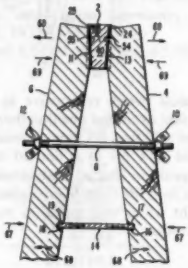
WEDGING SAWHORSE STAND

Larry D. Adams, 872 Weber Drive, Yardley, Pa. 19067

Filed Dec. 11, 1974, Ser. No. 531,651

Int. Cl.² F16M *11/00*

U.S. Cl. 182—186 **5 Claims**



1. A wedging sawhorse comprising:

a. a plurality of pairs of legs having obliquely tapered upper edges, said legs having slots therein located between the opposite ends thereof;

b. at least one spacing means securely mounted between said legs in said slots;

c. an adjustable tie rod means attaching each pair of said legs at a point above said spacing means; and

d. a beam mounted between said obliquely tapered edges of adjacent pairs of said legs, said beam having angular tapered grooves for receiving said obliquely tapered edges therein, said grooves being deeper at the lower end thereof to complement the obliquely tapered edges of said legs, tension between said legs and said beam being adjustable by relative vertical movement therebetween due to said beam being mounted above and spaced from said tie rod means such that as said beam is pressed downward the upper ends of said pairs of legs are moved apart and pivot about the tie rod means with the movement being limited by the width of said spacing means.

3,941,210

OIL MIST LUBRICATING SYSTEM AND CONDENSER DEVICE

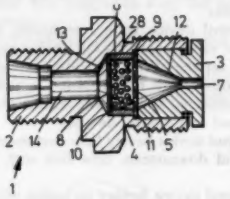
Horst Saretzky, Ennepetal, Germany, assignor to De Limon Fluhme & Co., Dusseldorf, Germany

Filed May 9, 1974, Ser. No. 468,479

Int. Cl.² B01D *55/00;* **F16N** *7/26*

U.S. Cl. 184—6.21 **22 Claims**

1. An oil mist condenser device for condensing oil drops from a fluid flow of oil mist carrying gas comprising in combination a duct, a constriction formed within the duct, a ball packing formed of particles arranged adjacent to the constriction and variably filling the flow cross section but being permeable to oil flow to condense drops of oil from said oil mist, the individual particles of said packing being freely movable



relative to one another thereby forming variable paths for said drops.

3,941,211

APPARATUS FOR CONTROLLING LUBRICATION OF COMPRESSED AIR TOOLS

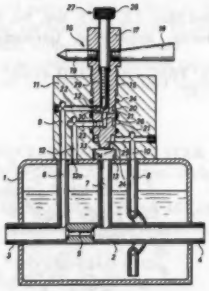
Walter Grütter, Gartenstrasse 118, CH 4052 Basel, Switzerland, and Gerhard Kapper, Neckarstrasse 32, D 7301 Zell (Neckar), Germany

Filed Jan. 3, 1975, Ser. No. 538,334

Claims priority, application Germany, Jan. 8, 1974, 2400758

Int. Cl.² F16N *7/34*

U.S. Cl. 184—56 A **8 Claims**



1. Apparatus for controlling lubrication of a compressed air tool by controlled continuous introduction of lubricating liquid into the supply of compressed air for said tool, said apparatus comprising:

a supply container for said lubricating liquid;

an air flow pipe extending through said supply container and adapted for connection at a first location with a supply of compressed air and at a second location with said tool;

flow throttling means disposed in said air flow pipe, with that portion of said pipe between said first location and said throttling means constituting the upstream side of said pipe and that portion of said pipe between said throttling means and said second location constituting the downstream side of said pipe;

a control device attached to said supply container;

a liquid supply tube disposed in said supply container and extending between said control device and the lubricating liquid in said supply container;

an upstream flow line disposed in saiid supply container and connected between the upstream side of said flow pipe and said control device;

said control device having flow channel means therein connecting said upstream flow line with an outlet opening communicating with said supply container whereby a

portion of the compressed air passing through said air flow pipe flows through said upstream flow line, said flow channel means and said outlet opening to apply pressure to the surface of the lubricating liquid in said supply container;

said control device further including adjustable air flow control valve means for controlling said pressure applied to the surface of the lubricating liquid;

a downstream flow line disposed in said supply container and connected between the downstream side of said flow pipe and said control device;

said control device having flow duct means therein connecting said downstream flow line with said liquid supply tube;

said control device further including adjustable liquid flow control valve means through which said flow duct means pass, with said liquid flow control valve means controlling the amount of liquid which can pass from said liquid supply tube to said downstream flow line;

said pressure applied to the surface of said lubricating liquid causing a portion of said liquid to flow through said liquid supply tube, past said liquid flow control valve means, through said downstream flow line and into the downstream side of said air flow pipe where it is introduced into the compressed air flowing therethrough and is hence conveyed to said second location.

3,941,212

CLOCKWORK MOTOR, ESPECIALLY FOR TOYS

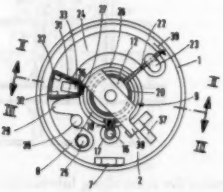
Walter Lechner, Siegelsdorf, Germany, assignor to Messrs. STELCO Spielwarenfabrik Stelter GmbH & Co. KG, Germany

Filed Mar. 13, 1975, Ser. No. 558,014

Claims priority, application Germany, May 7, 1974, 2421967

Int. Cl.² F03G *1/00;* **F16D** *49/00;* **G04B** *3/00*

U.S. Cl. 185—37 **8 Claims**



1. Clockwork motor, particularly for toys, comprising a resilient member adapted to function as a mainspring, an escapement consisting of a friction member and a sliding surface, a carrier carrying the friction member and spaced from and movable relative to the sliding surface which in use moves with a part of the clockwork motor running down under the action of the resilient member, a stationary end of the resilient member that normally serves for support being in engagement with the carrier such that the friction member is pressed towards the sliding surface with a force that is approximately proportional at any given moment to the driving force of the resilient member at that moment.

3,941,213

FORK LIFT WITH LIMIT SWITCH CONTROLLED RETRACTABLE GUARD

Harold A. Stammen, New Bremen, Ohio, assignor to Crown Controls Corporation, New Bremen, Ohio

Filed Feb. 7, 1974, Ser. No. 440,476

Int. Cl.² B66B *9/20*

U.S. Cl. 187—9 R **4 Claims**

1. A vehicle comprising

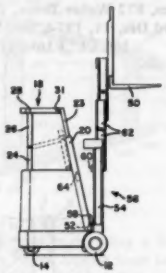
a. an operator's station,

b. an overhead guard positioned at said operator's station,

c. means for moving said overhead guard between an extended position disposed above said operator's station and a retracted position,

d. a fork lift mounted on said vehicle for movement between raised and lowered positions,

e. means for moving said fork lift over the entire range from a lowermost position to a fully raised position,



f. guard actuated switch responsive to movement of said guard from said extended position thereof and electrically connected to said fork lift moving means to permit movement of said fork lift in a limited range between said lowermost position and a predetermined height and to prevent said fork lift from being raised above a predetermined height when said guard is moved from its said extended position.

3,941,214

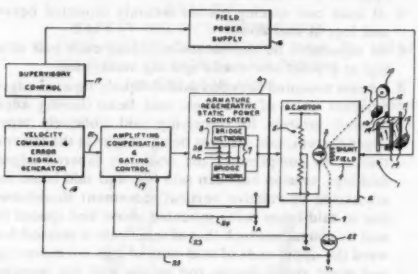
CONTROL SYSTEM FOR A TRANSPORTATION SYSTEM

Christopher Young, Glendale, and John T. Maynard, New Berlin, both of Wis., assignors to Armor Elevator Company, Inc., Louisville, Ky.

Filed Apr. 29, 1974, Ser. No. 465,270

Int. Cl.² B66B *1/30*

U.S. Cl. 187—29 R **23 Claims**



1. A transportation system having a guide path structure and a plurality of spaced landings and transportation means comprising a transport vehicle, means mounting said vehicle for movement relative to the structure in a path extending adjacent each of said landings, motive means moving said vehicle relative to the structure, vehicle responsive means coupled to said transportation means and providing a signal directly proportional to the speed of said vehicle, control means cooperating with said motive means and moving said vehicle relative to the structure and stopping said vehicle at a selected landing and including pattern generating means supplying a vehicle speed command signal operatively controlling the maximum velocity, acceleration, and rate of change of acceleration of said vehicle and first summing means operatively summing said vehicle speed signal and said vehicle speed command signal and providing an output speed error

signal operatively controlling the movement of said vehicle, said pattern means including first means generating a first signal imposing a limitation upon the maximum vehicle velocity and second means generating a second signal imposing a limitation upon the maximum vehicle rate of change of acceleration and third means integrating said second signal and providing a third signal and directly imposing a limitation upon said third signal to limit the maximum vehicle acceleration and fourth means coupled to receive said third signal and generating a fouth signal providing said vehicle speed command signal and second summing means operatively summing said first, third and fourth signals and supplying an input to said second means.

3,941,215

BICYCLE BRAKE ADJUSTING APPARATUS

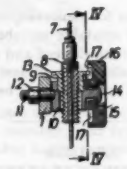
Robert Schoch, Singen, Hohentwiel, Germany, assignor to Weinmann Aktiengesellschaft, Schaffhausen, Switzerland

Filed June 23, 1975, Ser. No. 589,254

Claims priority, application Germany, June 27, 1974, 2430871; May 22, 1975, 7516284[U]

Int. Cl.² F16D *65/46, 65/56*

U.S. Cl. 188—24 **10 Claims**



1. Apparatus for adjusting the distance between brake blocks of a bicycle rim brake having stirrups pivotal relative to one another in response to axial movement of a bowden cable core passing through a cover and fixed to one of said stirrups, said apparatus comprising a lug fixed to the other of said stirrups; an internally threaded sleeve rotatably carried by said lug; an axially bored, externally threaded screw fixed to the cover of said bowden cable and in threaded engagement with said sleeve, said core passing through said screw; a toothed flange fixed to said sleeve; a driver having teeth in mesh with the teeth of said flange; and means mounting said driver on said lug for rotation whereby the teeth on said driver and said flange effect rotation of the latter and axial adjustment of said screw with consequent axial adjustment of said core and cover and relative pivotal movement of said stirrups.

3,941,216

BRAKE SHOE SUPPORT FOR A SPOT-TYPE DISC BRAKE

Jochen Burgdorf, Offenbach, Germany, assignor to ITT Industries, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 449,297, March 8, 1974, abandoned. This application Mar. 18, 1975, Ser. No. 559,603

Claims priority, application Germany, Mar. 20, 1973, 2313692

Int. Cl.² F16D *55/224, 69/04*

U.S. Cl. 188—72.4 **5 Claims**

1. An arrangement to support a brake shoe of a spot-type disc brake comprising:

a housing having a longitudinal axis;

an actuation device disposed in said housing coaxial of said axis;

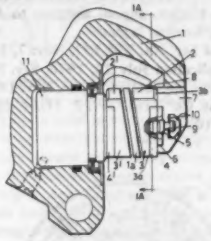
a caliper connected to said housing and embracing a brake disc;

a first brake shoe connected to said actuation device and perpendicular to said axis;

a second brake shoe perpendicular to said axis and associated with said caliper remote from said actuation device, said second brake shoe including a brake pad carrier plate and a brake pad, said brake pad having a first portion perpendicular to said axis and a second portion parallel to said axis extending over the outer edge of said carrier plate;

a supporting bore disposed coaxial of said axis in said caliper remote from said actuation device;

at least a first projection extending from and integral with said carrier plate in engagement with said supporting bore;



a supporting surface provided in said caliper remote from said actuation device at the end of said supporting bore adjacent said carrier plate, said supporting surface abutting said second portion of said brake pad to prevent twisting of said second brake shoe; a supporting bolt secured to said carrier plate coaxial of said axis and extending into said supporting bore; and

a retaining spring secured to said caliper extending into said supporting bore and fastened to said supporting bolt.

3,941,217

VEHICLE BRAKE ADJUSTER

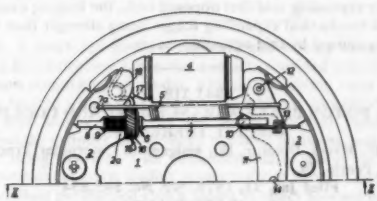
Manfred Kaub, Rhens (Rhine), Germany, assignor to Girling Limited, Birmingham, England

Filed Apr. 3, 1974, Ser. No. 457,487

Claims priority, application United Kingdom, Apr. 3, 1973, 15885/73

Int. Cl.² F16D *65/56*

U.S. Cl. 188—79.5 GT **1 Claim**



1. A vehicle wheel internal shoe drum brake comprising a fixed back plate; first and second opposed arcuate brake shoes mounted on said back plate; shoe return spring means biasing said shoes towards each other; actuating means acting between one pair of adjacent shoe ends to move said shoes apart against the bias of said shoe return spring means and apply the brake; a handbrake lever pivotally mounted on said first shoe; an elongate two-part reaction strut having a non-rotatable part which engages said lever, and a rotatable part in the form of a nut member in screw-threaded engagement with said non-rotatable part and directly engaging said second shoe, whereby movement of said lever is transmitted through said strut to said second shoe, said nut member having ratchet

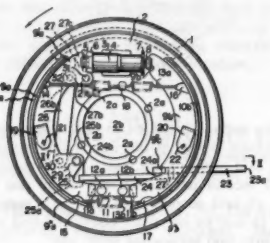
teeth of helical form on its periphery; spring means biasing said strut into engagement with said lever and towards said first shoe; and a coil torsion spring mounted on said second shoe with its axis parallel with the wheel axis; said torsion spring having two opposed end portions, one said end portion engaging said second shoe and the other said end portion constituting a pawl biased towards and engaging the periphery of said nut member.

3,941,218

BRAKE APPARATUS AND PLURAL AND INDEPENDENT ACTUATORS THEREFOR

Tatsumi Torii, Kariya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Continuation of Ser. No. 774,137, Nov. 7, 1968, abandoned. This application July 23, 1970, Ser. No. 64,048
Claims priority, application Japan, Nov. 14, 1967, 42-73260
Int. Cl.² F16D *51/22, 51/24, 65/14*
U.S. Cl. 188—106 F 11 Claims



1. A brake apparatus for motor vehicles comprising a rotatable brake drum having a friction surface, a stationary backing plate, a pair of brake shoes mounted on said backing plate and arranged adjacent said friction surface of said brake drum, an actuating means positioned between only a first opposed ends of each of said brake shoes for selectively moving said first ends into contact with said friction surface, and mechanical expanding means for selectively moving the other opposed ends of said brake shoes and said first opposed ends of said brake shoes into contact with said friction surface and maintaining said contact, by all four of said ends of said shoes, said mechanical expanding means comprising a link and toggle means for expanding said other opposed ends and for simultaneously expanding said first opposed ends, the braking caused by said mechanical expanding means being stronger than the braking caused by said actuating means.

3,941,219

DUAL PISTON BRAKE ARRANGEMENT AND COOLING CIRCUIT THEREFOR

Allen D. Myers, Decatur, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 31, 1975, Ser. No. 545,854
Int. Cl.² F16D *65/24*
U.S. Cl. 188—170 6 Claims

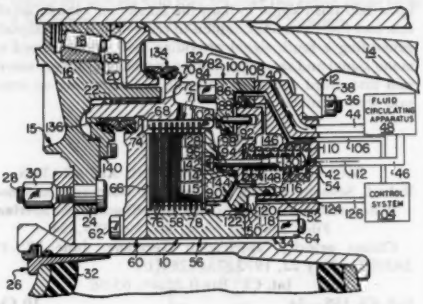
1. An annular dual piston brake arrangement for selective holding engagement of a rotatable member of a drive train, having an annular braking surface thereon, comprising;

a support structure;

an annular service brake piston axially reciprocably and nonrotatably mounted within said support structure including fluid passage means therethrough;

actuating means for biasing said annular service brake piston concentrically toward a brake holding position with respect to the annular braking surface of such rotatable member;

an annular secondary brake piston axially reciprocably and nonrotatably mounted within said support structure and in substantially radially aligned compact relation within said service brake piston for telescopic selective movement from an abutting to a separated condition therefrom; and



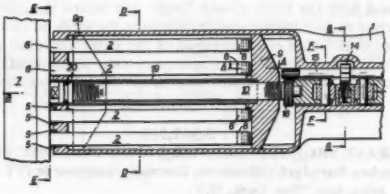
fluid circulating means for delivering a fluid radially outwardly toward said rotatable member and said service brake piston for cooling thereof and subsequently along an egress path including flow of said fluid through said fluid passage means in said service brake piston.

3,941,220

RAILWAY BRAKES

Anthony William Harrison, Birmingham, England, assignor to Girling Limited, Birmingham, England

Division of Ser. No. 430,692, Jan. 4, 1974. This application Feb. 25, 1975, Ser. No. 552,924
Claims priority, application United Kingdom, Jan. 5, 1973, 852/73
Int. Cl.² F16D *65/56*
U.S. Cl. 188—196 BA 5 Claims



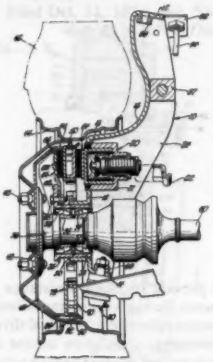
1. A brake for engagement with a rotor, comprising friction material engageable with said rotor, and adjusting means for adjusting the position of said friction material relative to said rotor to compensate for wear of said friction material, said adjusting means comprising an elongate screw member, screw threaded means associated therewith, said screw-threaded means being movable forwardly towards one end of said screw member to adjust the position of said friction material relative to said rotor, and destructible thread protecting means surrounding a forward portion of the thread of said screw member on to which said screw-threaded means passes during adjustment, whereby said protecting means is progressively destroyed as said screw-threaded means passes along said screw member, said forward thread portion being at all times protected by said protecting means.

3,941,221

DISC BRAKE ROTOR ASSEMBLY

William L. Pringle, Grosse Pointe Shores, Mich., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Oct. 31, 1974, Ser. No. 519,523
Int. Cl.² F16D 65/12
U.S. Cl. 188—218 XL 6 Claims



1. A disc brake rotor assembly comprising; a first disc member, a second disc member, said first disc member being an integral metal member having an annular configuration defining an inner diameter and an outer diameter, said first disc member being L-shaped in cross section with the long leg of the L-shape extending radially and the short leg of the L-shape extending axially from one of said inner and outer diameter, said second disc member being an integral metal member having an annular configuration defining an inner diameter and an outer diameter, said second disc member having a generally U-shaped configuration in cross section with the base of the U-shape extending radially with a first leg of the U-shape extending axially from the outer diameter and a second leg of the U-shape extending axially from the inner diameter, said legs engaging said first disc member for axially spacing said radially extending base of said second disc member from said radially extending leg of said first disc member, said axially extending legs of said second disc member and said axially extending short leg of said first disc member having openings extended radially therethrough for air to circulate between said radially extending base of second disc member and said radially extending leg of said first disc member, said first leg of said second disc member abutting the inner radial surface of said radially extending leg of said first disc member, said short leg of said first disc member extending axially from said inner diameter thereof, said short leg of said first disc member being disposed radially outwardly of said second leg of said second disc member and in radially abutting engagement therewith.

3,941,222

VEHICLE SHOE DRUM BRAKES

Charles Newstead, Walsall, England, assignor to Girling Limited, Birmingham, England

Continuation-in-part of Ser. No. 802,125, Feb. 25, 1969, abandoned. This application May 3, 1971, Ser. No. 139,822
Int. Cl.² F16D 69/00
U.S. Cl. 188—250 G 7 Claims

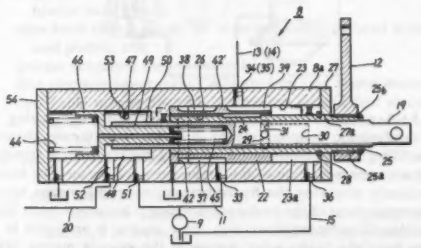
1. A vehicle drum brake shoe comprising an arcuate shoe platform component and an arcuate carrier plate having rigidly attached thereto a correspondingly curved layer of friction material, said carrier plate having struck therefrom in the direction of its concave side a plurality of preformed projections, some of said projections defining tongues having axially extending portions which extend in the same direction and are spaced away from the concave side of said carrier plate substantially parallel thereto, a plurality of slots in said shoe platform each of a size to enable siad preformed projections including said tongues to be inserted into said openings when said carrier plate is moved radially into engagement with the convex face of the platform component, the spacing of the axially extending portions from the concave face of said carrier plate being such that the inner faces of the axially extending portions engage the concave surface of said platform component solely upon axial movement of said lining component following radial insertion of said projections into said slots, and retaining means comprising manually releasable clamping means between the shoe platform and the carrier plate for preventing separation of one from the other, at least some of said slots having opposed circumferential sides engaged by the corresponding edges of the projections therein to sustain separate from said retaining means the braking torque exerted on said friction material.

3,941,223

INCHING VALVE

Kiyoharu Murakami, Neyagawa, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Filed June 3, 1974, Ser. No. 476,077
Claims priority, application Japan, June 14, 1973, 48-67580
Int. Cl.² F16D 67/04
U.S. Cl. 192—4 A 2 Claims



1. A combined forward, rearward and inching valve structure for controlling a motorized vehicle provided with braking means comprising a cylinder, a cylindrical piston valve member located within said cylinder and which is capable of both an axial sliding movement and also a rotational movement about the cylinder axis between two limit positions, said cylinder being provided with circumferentially spaced first and second outlet ports leading respectively to forward and rearward fluid pressurized clutch means to effect forward or rearward movement of the vehicle, a hollow forward-rearward select shaft rotatably mounted in said cylinder and on which said piston valve is mounted for rotation between said limit positions, an inching shaft mounted for axial sliding movement within said hollow select shaft, means coupling said inching shaft with said piston valve member for effecting axial movement of said valve member upon axial movement of said inching shaft, means coupling said inching shaft to the brake operating means of said vehicle, a pressurized fluid source, conduit means connecting said pressurized fluid source to an inlet port on said cylinder leading to fluid distributing passages provided on said piston valve by which the pressurized fluid is led to a selected one of said outlet ports upon axial movement of said piston valve in response to movement of said inching

shaft in the brake releasing direction, a piston controlled fluid pressure regulating chamber provided within said cylinder, conduit means interconnecting said pressure regulating chamber with the conduit means leading to said inlet port, and means controlling movement of the piston in said fluid pressure regulating chamber in accordance with movement of said inching shaft in the brake releasing direction to effect a progressive increase in fluid pressure in said pressure regulating chamber thereby to effect a progressive increase in pressure of the fluid being conducted to the selected clutch means which results in inching movement of the vehicle.

3,941,224

CONTINUOUS HYDRODYNAMIC BRAKE FOR MOTOR VEHICLES, ESPECIALLY HEAVY COMMERCIAL VEHICLES

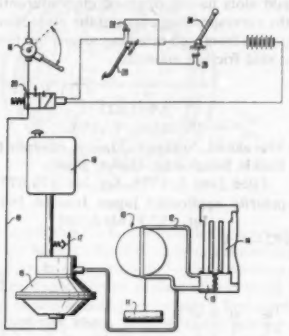
Hans Hanke, Stuttgart, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Feb. 5, 1975, Ser. No. 547,166

Claims priority, application Germany, Feb. 7, 1974, 2405740

Int. Cl. B60k *41/24, 41/26*

U.S. Cl. 192—13 A **7 Claims**



1. A continuous brake for motor vehicles comprising a hydrodynamic coupling means, a brake valve means, means for filling the hydrodynamic coupling means from a storage means upon actuation of the brake valve means and for automatically emptying the hydrodynamic coupling means upon disengagement of the brake valve means, characterized in that a solenoid-actuated three-way valve means is arranged in a line from the brake valve means to the storage means, said solenoid-actuated three-way valve means being operable, when energized, to close the line section from the brake valve means and to vent the line section leading to the storage means, and switch means operatively connected in the energizing circuit of said solenoid valve means, said switch means being operable to close upon disengagement of a clutch.

3,941,225

SPEED LIMITING ACCESSORY DRIVE SYSTEM AND APPARATUS THEREFOR

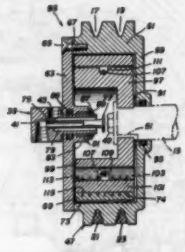
Samuel Shiber, Mundelein, Ill., assignor to MacLean-Fogg Lock Nut Company, Mundelein, Ill.

Filed May 20, 1974, Ser. No. 471,432

Int. Cl.² F16D *43/14*

U.S. Cl. 192—104 C **13 Claims**

1. A centrifugally-actuatable, speed-limiting mechanism for the transmission of torque, comprising: a driving member and a driven member, said driven member being interposed about said driving member for coaxial rotation therewith, said driving member having a cylindrical frictional surface adjacently opposing an interrupted mating journalling surface on said driven member; centrifugally actuatable frictional pad means interposed between said members and carried by said driven member; means biasing said pad means against predetermined centrifugal forces acting thereon, whereby said pad means are operable to partially disengage said driven member from said driving member above a predetermined rotational design speed of said mechanism; said cylindrical frictional surface further characterized by being adapted to provide substantially all of the bearing journalling support of said driven



member and further provide frictional resistance to said carried frictional pad means during torque transmission between said members; seal means operable to seal said driven member about said driving member; circulation means operable to circulate a liquid lubricant and coolant completely throughout said mechanism, and external cooling means communicating with said circulation means for effecting cooling of said circulated liquid lubricant and coolant.

3,941,226

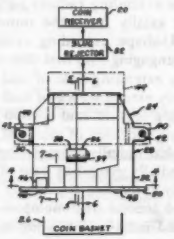
ELECTRONIC COIN SWITCH

Russell J. Drakes, Buffallo, N.Y., assignor to The Wurlitzer Company, Chicago, Ill.

Filed Mar. 22, 1974, Ser. No. 453,686

Int. Cl.² G07F *1/04*

U.S. Cl. 194—1 R **7 Claims**



1. An electronic coin switch for use as in a vending machine comprising a housing having a plurality of coin chutes therein, step means in each of said coin chutes for retarding the fall of a coin therethrough to a controlled rate, means providing a plurality of light paths across said chutes, means providing a plurality of cavities in said housing respectively adjacent said chutes to receive light sources to establish said light paths, means providing an additional plurality of cavities in said housing to receive a plurality of light sensors respectively positioned along said light paths on the opposite sides of said chutes and receiving light from a respective light source, a printed circuit board, means mounting said printed circuit board on said housing adjacent the exit ends of the chutes, said printed circuit board having slots therein respectively aligned with said chutes, a plurality of light sources and light sensors preassembled on said printed board and received in the respective cavities, and a plurality of additional electrical

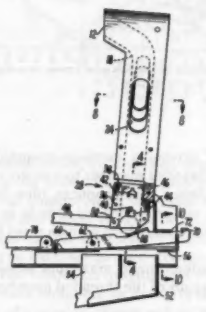
components preassembled on said printed circuit board and mounted exteriorly of said housing.

3,941,227

COIN BOX MECHANISM

Roger G. Gordon, Richmond, Calif., assignor to Safe Rack, Inc., San Leandro, Calif.

Filed Oct. 11, 1974, Ser. No. 514,009
Int. Cl.[2] G07F 11/00
U.S. Cl. 194—1 K 7 Claims



1. A coin operated mechanism wherein a coin of a proper denomination will release said mechanism, comprising in combination:

a. slot means for receiving a coin and passing the coin downward into coin receiver means,

b. said coin receiver means having spaced parallel sidewalls, said walls being spaced by an amount slightly greater than the thickness of a coin destined to pass through said coin receiver,

c. at least one generally horizontal slot in a wall of said coin receiver,

d. a U-shaped member adapted to fit into said horizontal slot, said U-shaped member having a long side and a short side and having an included angle of about 45 degrees whereby said member can be placed in said horizontal slot with the small end inside said receiver whereby the long end will hang by gravity parallel to and adjacent said wall with the small end protruding into the coin space between the walls,

e. said U-shaped member being adapted to tilt and allow a coin to pass through said coin receiver and being restored to its former position by gravity so that a coin cannot move upwardly within the receiver,

f. a slide mechanism mounted under said coin receiving means, said slide including a pivoted lever, said lever having a cam surface disposed under said coin receiver,

g. said pivoted lever having a latch member normally biased in locked position,

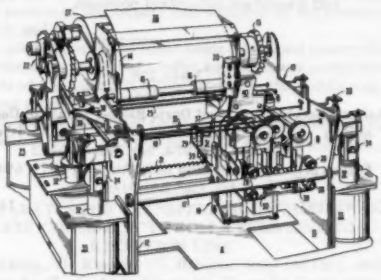
h. said cam surface being adapted to contact a coin held in said coin receiving means and to move said pivoted lever downwardly by the action of said coin on said cam when said slide member is moved forward, whereby said pivoted lever is released by said latching member, permitting said slide to move forward.

3,941,228

ELECTROMAGNETICALLY OPERATED PRINTER

Fritz Keiser, Ebmatingen, Switzerland, assignor to Firma Precisa AG. Rechenmaschinenfabrik, Zurich, Switzerland

Filed June 10, 1974, Ser. No. 478,343
Claims priority, application Germany, June 13, 1973, 2330086; Apr. 19, 1974, 2419020
Int. Cl.[2] B41J 23/04, 1/32
U.S. Cl. 197—18 34 Claims



1. A serial printer suitable for operable connection to an electronic calculator and the like, said printer comprising:

a frame means;

a platen mounted on said frame means;

a carriage on said frame means being movable in step-by-step fashion adjacent said platen in parallel relation to the axis of said platen;

a type-head for carrying type indicia, said type-head being mounted on said carriage for translational and rotational type-shifting movements and for printing movement toward said platen;

type-head shifter means for impelling said type-head toward said platen; and

printer actuating means comprising:

first electromagnet means mounted on said frame means;

first cable means operably connected to said first electromagnet means for being displaced by operation of said first electromagnet means;

type-head translating means for translating said type-head independently of minor variations in length of said first cable means including:

first shiftable means mounted on and carried by said carriage in driving connection with said type-head, said first shiftable means being connected to said first cable means to be shifted to a plurality of translation adjustment positions in response to selective operation of said first electromagnet means for translating said type-head in a manner changing the type indicia disposed in printing position,

first stop means mounted on said carriage and being engageable with said first shiftable means to:

define said translation adjustment positions,

locate said first shiftable means in said translation adjustment positions, and

prevent overtravel of said first shiftable means beyond said translation adjustment positions;

second electromagnet means mounted on said frame means;

second cable means operably connected to said second electromagnet means for being displaced by operation of said second electromagnet means; and

type-head rotating means for rotating said type-head independently of minor variations in length of said second cable means including:

second shiftable means mounted on and carried by said carriage in driving connection with said type-head, said second shiftable means being connected to said second cable means to be shifted to a plurality of rotary adjust-

ment positions in response to selective operation of said second electromagnet means for rotating said type-head in a manner changing the type indicia disposed in printing position, and

second stop means mounted on said carriage and being engageable with said shiftable means to:

define said rotary adjustment positions,

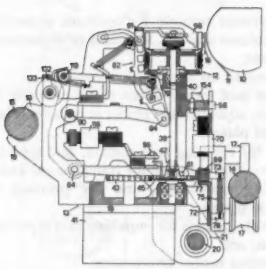
locate said second shiftable means in said rotary adjustment positions, and

prevent overtravel of said second shiftable means beyond said translation adjustment positions.

3,941,229
SERIAL PRINTING DEVICE

Raffaele Becchi, Ivrea, and Dario Bisone, Montalto Dora, both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Aug. 5, 1974, Ser. No. 494,422
Claims priority, application Italy, Aug. 14, 1973, 69445/73
Int. Cl.² B41J *1/32*
U.S. Cl. 197—53 **16 Claims**



1. A serial printing device comprising:

a platen;

a base member adjacent to said platen;

a type drum rotatably mounted on said base member;

a plurality of character-bearing elements;

mounting means for mounting said plurality of elements on the periphery of said drum for radially outward movement therefrom;

biasing means for biasing said character bearing elements against said drum;

angularly positioning means for rotating said drum on said base member to position a selected character-bearing element in front of said platen;

a hammer movably supported with respect to said drum to be spaced apart from the selected character-bearing element and actuatable for pushing said selected character-bearing element radially outwardly relative to said drum against the action of said biasing means;

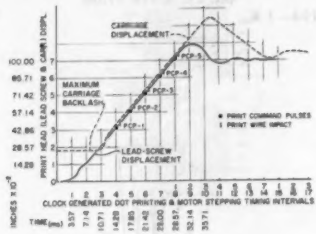
actuatable means for moving said drum towards said platen; and

means interconnecting said hammer with said drum for actuating said hammer in response to the actuation of the actuatable means to simultaneously actuate said drum and said hammer whereby the hammer pushes outwardly for printing only the selected character when the drum moves toward the platen.

3,941,230
BACKLASH COMPENSATED LINEAR DRIVE METHOD FOR LEAD SCREW-DRIVEN PRINTER CARRIAGE

Joseph A. Bellino, Arlington Heights, and Leo von Braun, Chicago, both of Ill., assignors to Teletype Corporation, Skokie, Ill.

Filed Aug. 9, 1974, Ser. No. 495,943
Int. Cl.² B41J *19/20*
U.S. Cl. 197—90 **11 Claims**



1. A method of driving a carriage-mounted print head, coupled through a threaded member to a motor-driven helical lead screw, in a manner that produces time-linear carriage motion for printing uniformly spaced indicia in rapid succession during each print cycle along a given print line, including the steps of:

establishing a predetermined maximum possible clearance between the threads of the threaded member and the lead screw;

starting the motor preparatory to printing;

delaying the printing of the first indicum not only until the motor and lead screw have been accelerated up to the desired angular rate of speed, but until the threaded member-lead screw clearance has been taken up, and any kinetic energy imparted carriage impact bounce forces resulting therefrom have been damped, at which time the carriage is then smoothly driven and at a substantially constant rate of speed by the lead screw;

printing said indicia associated with each print cycle at uniformly timed intervals and with uniform spacings along each print line as a result of said carriage being driven at a constant speed during each print cycle;

decelerating and stopping the motor prior to the printing of at least the last indicium associated with each print cycle preceding the stopping of the carriage; and

relying on the inertial movement of the carriage and utilizing the clearance between the threaded member and the lead screw to propel the carriage and print head mounted thereon at said substantially constant speed during the printing of at least said last indicium.

3,941,231
RIBBON CARTRIDGE

George Coleman Matuck; Gerald Carl Sienkiewicz, and William Duncan Thorne, all of Raleigh, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed July 3, 1974, Ser. No. 485,654
Int. Cl.² B41J *35/04*
U.S. Cl. 197—151 **1 Claim**

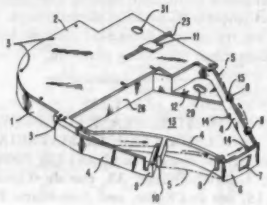
1. A cassette apparatus for an endless, randomly folded, loop of inked ribbon, or web, adapted for use in a printing device comprising:

a web storage compartment having walls and two parallel covers for containing the bulk of said endless loop folded randomly on its transverse axis; said storage compartment having separate inlet and outlet apertures in separate walls thereof for the ingress and egress of portions of said endless loop;

continuous loop guide means for guiding, supporting and confining the entire length of the path of a loop formed in said web external to said compartment;

said loop guide means extending from the point of egress of said loop in one said wall of said compartment to the point of ingress of said loop in another said wall of said compartment;

said guide means being affixed externally to said compartment at said egress and ingress locations in said walls, and enclosing, together with an external wall of said compartment lying between said ingress and egress location walls



in said compartment, an enclosed area, the perimeter of said area being defined by said loop guide means and by said external compartment wall, said wall being between said ingress and egress location walls;

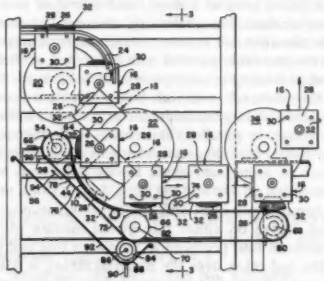
said apparatus further comprising means attached to said guide means external to said compartment for turning said web 180° about its longitudinal axis;

said guide means including an aperture therein for exposing both sides of a portion of said web to the outside environment adjacent said aperture in a direction perpendicular to the flat surfaces of said web.

3,941,232
CURVED PATH DELIVERY CONVEYOR

Ralph C. Parkes, Hancock St. & Lehigh Ave., Philadelphia, Pa. 19133

Filed Dec. 17, 1973, Ser. No. 425,076
Int. Cl.² B65G 47/00
U.S. Cl. 198—20 R **14 Claims**



1. In a curved path delivery conveyor for function with a conveyor system the combination of

A. an endless belt defining an upper path and a lower path,

1. said belt rotating about an upper positioned roller and a lower positioned roller,

a. the said lower positioned roller lying in a first horizontal plane that is spaced from and below a second horizontal plane drawn through the upper positioned roller;

B. means including a middle positioned roller to tension the lower belt path between the lower positioned roller and the upper positioned roller,

1. at least a portion of the said upper path of the belt being untensioned to form a curved configuration portion,

2. the said lower path being tensioned for belt rotation purposes,

3. the said conveyor system conveying containers through an arcuate path, the said curved configuration of the upper path being spaced from and parallel with at least a portion of the arcuate path followed by the containers; and

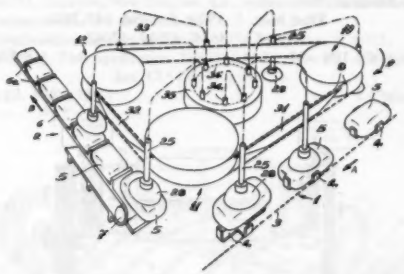
C. the middle positioned roller being positioned intermediate the upper positioned roller and the lower positioned roller wherein the belt moves relative to the middle positioned roller,

1. the middle positioned roller being located in the spaces defined by the said first or second horizontal planes.

3,941,233
APPARATUS FOR TRANSFERRING BODIES OF DELICATE CONSISTENCY FROM A FEED LINE TO A RECEPTION LINE

Franco Aiuola, via Ranzani 17, Bologna, Italy (40100), and Herbert Rueff, via Anna Frank 10, Croce Di Casalecchio, Italy

Continuation of Ser. No. 358,195, May 7, 1973, abandoned. This application Mar. 3, 1975, Ser. No. 554,792
Int. Cl.² B65G 47/52
U.S. Cl. 198—20 R **1 Claim**



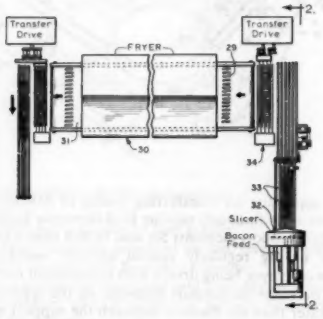
1. An apparatus for transferring bodies of delicate consistency from a continuously moving feed conveyor having regularly spaced support elements for said bodies onto a reception conveyor having regularly spaced support members, said reception conveyor being driven with intermittent motion, the distance between the support elements on the feed conveyor being greater than the distance between the support members on the reception conveyor, said apparatus comprising a transfer conveyor moving along a closed path lying in a horizontal plane, said transfer conveyor having a first portion extending parallel to the feed conveyor and a second portion extending parallel to the reception conveyor, transmission means for driving said transfer conveyor with the same speed of said feed conveyor, aspirator means consisting of suckers supported by said transfer conveyor slidably in a vertical direction, cam members arranged along said first and second portion for causing the aspirator means to move vertically thereby to approach said feed conveyor in timed relation therewith to engage the bodies and then to raise for removing the bodies and to transfer and deposit them on the reception conveyor, flexible ducts and a rotating distributor connecting said suckers to a suction pump, wherein according to the improvement said rotating distributor comprises a column arranged within an area surrounded by said path of said transfer conveyor, a disc mounted for rotation on said column about a vertical axis,

connectors for said flexible ducts regularly distributed on a circumference on the upper face of said disc concentrically about said vertical axis, a gear-wheel toothing on the periphery of said disc, said transmission means for driving said transfer conveyor including a driving sprocket and a chain transmissively engaging said gearwheel toothing and said driving sprocket, the transmission ratio between said gearwheel toothing and said driving sprocket being such that when the transfer conveyor has covered a way equal to its entire length, the disc has made one complete revolution, a ring member arranged underneath the face of said disc opposite to that provided with the connectors, spring means pressing said ring member against said face, support means for said ring permitting axial displacement and preventing rotation thereof, said ring having a periphery defining a surface area eccentric with respect to said circumference on which said connectors are arranged so that part of said circumference extends within said surface area and another part thereof extends outside said surface area, a cavity in said ring connected with said suction pump and opening at said surface area so as to communicate with the connectors reaching said part of said circumference during the rotation of said disc, means for angularly adjusting said ring with respect to said disc, said cavity having an angular extension such as to connect the suckers with said suction pump during removal and transfer of the bodies from the feed conveyor onto the reception conveyor and to disconnect the suckers thereafter.

3,941,234
CONVEYOR LOADING SYSTEM

James L. Balch; James E. Anderson, and Boleslaus J. Sadeski, all of Madison, Wis., assignors to Oscar Mayer & Co., Inc., Madison, Wis.

Filed Mar. 1, 1974, Ser. No. 447,392
Int. Cl.² B65G *47/00, 47/42*
U.S. Cl. 198—21 **6 Claims**



1. A system for transferring a finite number of items from a first unidirectionally driven conveyor onto a second unidirectionally driven conveyor aligned at right angles to said first conveyor, said system comprising, in combination:

a carriage loading platform comprising a plurality of parallel spaced-apart cantilevered conveyor belts arranged at the discharge end of said first conveyor;

means for unidirectionally driving at least a portion of said conveyor belts to move said items from said first conveyor onto said carriage loading platform;

a transfer carriage comprising a plurality of parallel spaced-apart cantilevered support members anchored to a carriage support block at one end, said support members being arranged in a plane and spaced so as to pass between respective ones of said cantilevered conveyor belts;

a carriage offloading platform comprising a plurality of parallel spaced-apart cantilevered support rods arranged at the input end of said second conveyor to form a contiguous path therewith for said items;

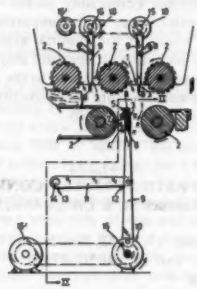
means for rotating at least a portion of said rods so as to move said items from a predetermined offloading position onto said conveyor; and

carriage actuator means responsive to the presence of said items at a predetermined location on said first conveyor for cycling said transfer carriage along an operating path whereby said support members are caused to successively pass between said cantilevered support belts of said carriage loading platform and said cantilevered support rods of said carriage offloading platform while being maintained in a substantially horizontal plane, said items having advanced onto said loading platform prior to said support members passing therethrough whereby said items are transferred from said carriage loading platform to said carriage offloading platform.

3,941,235
CONVEYOR WITH MEANS FOR PREVENTING ACCUMULATION OF MATERIAL

Hubert Pierret, 29, rue du Tambour; Luc Pierret, 13, rue du Sommet; Gabriel Pierret, 33, rue du Tambour; Maurice Pierret, 15, rue de l'Eglise, and Jean-Marie Pierret, Rue du Sommet, all of B - 6838 Corbion-sur-Semois, Belgium

Filed Nov. 20, 1973, Ser. No. 417,495
Claims priority, application Belgium, Nov. 22, 1972, 791755
Int. Cl.² B65G *47/02*
U.S. Cl. 198—27 **12 Claims**

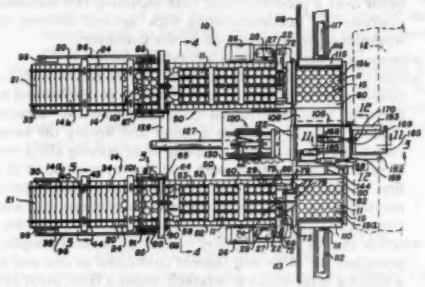


1. Conveyor, particularly a conveyor for materials in the shape of fibres lying in a sheet, said conveyor comprising at least two consecutive conveying elements at least one of which is movable and between which there remains a space; at least two movable parallel rods supported at their ends by arms and extending in said space cross-wise to the lengthwise axis of the conveyor, said rods being slidable on one another and said arms sliding inside guides so arranged as to allow the rods to move in parallel relationship with themselves; and moving means including two identical cams associated with each pair of arms, said cams having staggered bosses and being mounted on one and the same driving shaft, said moving means imparting to each arm an alternating motion such that each rod moves on either side of the median plane of said space between four positions as follows: a first end position in which the rod takes over the material falling in said space, a second end position in which the rod lays the material having entered said space in such a position that said material will be taken over by the second conveyor element to pursue the conveying thereof on said conveyor, and two intermediate positions in which the rod is situated in the proximity of the conveyor movable element and the second conveyor element; said moving means being arranged so as the rod and said conveyor movable element are driven in the same direction and so as the rod defines a continuous curve in passing from one position to another, the movements of the rods being mutually displaced.

3,941,236
INFEED APPARATUS FOR CARTON LOADING MACHINES

Hans Hagedorn, 947 Huntington Crescent, North Vancouver, British Columbia, Canada

Filed Dec. 13, 1973, Ser. No. 426,716
Int. Cl.² B65G 47/22
U.S. Cl. 198—29 **19 Claims**



1. Apparatus for grouping containers and feeding the groups to a carton loading machine, comprising a smooth-surfaced endless conveyor having a receiver end for receiving containers to be loaded into cartons and a discharge end, a platform at the discharge end of the conveyor and positioned to receive containers therefrom, a guide overlying the conveyor at the discharge end thereof, said guide being divided by a plurality of laterally spaced partitions into a plurality of open-ended channels extending longitudinally of the conveyor and terminating in inner ends near said platform, a stationary guide section overlying said conveyor between said guide and said platform, said guide section including a plurality of spaced partitions forming open-ended channels normally aligned with the partitions and channels, respectively, of said guide, means for pivotably supporting said partitions of said guide so that the inner ends thereof can be shifted laterally out of alignment with the partitions of said guide section, said conveyor moving containers successively into and through the channels and on to and across the platform in rows, stop means above the platform and spaced a distance from the conveyor and said guide partitions to be engaged by containers when a predetermined number of containers in the rows are moved on to the platform, power means connected to the guide partition inner ends for shifting said ends laterally into positions opposite the adjacent ends of the rows of containers on the platform, and operating means at said stop means and operatively connected to said power means and operated by containers at the stop means to cause the power means to laterally shift the inner ends of the partitions of the guide out of alignment with the partitions of the guide section when said predetermined number of containers are on the platform so as to lock the containers on the platform.

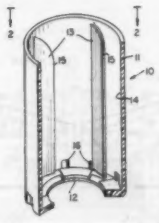
3,941,237
PUCK FOR AND METHOD OF MAGNETIC CONVEYING

Fred M. MacGregor, Jr., West Keansburg, N.J., assignor to Carter-Wallace, Inc., New York, N.Y.

Filed Dec. 28, 1973, Ser. No. 429,648
Int. Cl.² B65G 17/46
U.S. Cl. 198—41 **2 Claims**

1. A puck for magnetically conveying an article, comprising:

a plastic cylindrical container, including an open interior for receiving an article, an open bottom and an open top for inserting an article into the container, a plurality of circumferentially spaced vertical deflectable resilient plastic fins integral with the interior wall of the container and extending angularly inwardly at an acute angle therefrom, said fins extending substantially over the length of the container and having free ends spaced from the interior wall of the container whereby the fins are deflected toward the container wall upon insertion of an article into the container for holding the article within the container; and

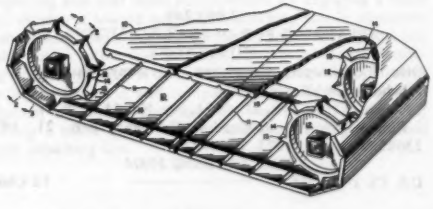


a magnetic material in the form of a ring secured to the container bottom, whereby an article can be magnetically conveyed in said container in all directions.

3,941,238
INTEGRAL HINGED FOOD CONVEYOR BELT CONSTRUCTION WITH LEVITATION MEANS

James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, New Orleans, La.

Continuation-in-part of Ser. No. 414,292, Nov. 9, 1973, abandoned. This application July 16, 1974, Ser. No. 488,899
Int. Cl.² B65G 15/42
U.S. Cl. 198—184 **1 Claim**

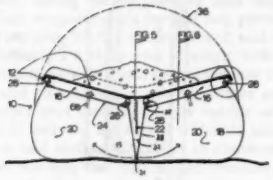


1. In combination a pair of drive sprockets having triangular spaced apart teeth extending axially of the sprocket about the circumference thereof and a polygonal aligning guide located substantially centrally of the sprocket, an endless food conveyor belt comprising an endless loop of polypropylene or polyethylene having integral hinge properties having an upper load supporting run and a lower return run, said loop having spaced areas of reduced thickness transversely of said belt defined by notches from the inside of the loop toward the outside adapted to mate with the triangular spaced apart teeth about the circumference of the sprocket, and said loop having a groove substantially centrally of the width of said loop adapted to be engaged by the triangular aligning guide located centrally of the sprocket, and air levitation means positioned below the upper load supporting run to reduce surface drag of the upper run of the conveyor comprising a plenum chamber having a perforate top below the upper run of the conveyor for directing a cushion of air from a low pressure source against the upper load supporting run of the conveyor.

3,941,239
TRANSPORTATION SYSTEM

Norbert Hamy, Beaconsfield, Canada, assignor to Trebron Holdings Limited, Beaconsfield, Canada

Filed Jan. 11, 1974, Ser. No. 432,488
Claims priority, application United Kingdom, Jan. 13, 1973, 1900/73
Int. Cl.² B65G *15/00*
U.S. Cl. 198—184 **24 Claims**

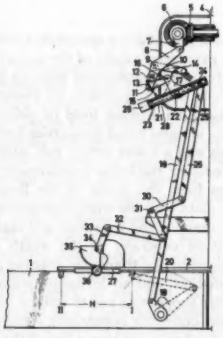


1. A transport system comprising a collapsible support body of at least two parallel flexible air bags, a continuous loop of flexibly coupled loop segments, said continuous loop being disposed above said collapsible support body for at least a portion of its length, an air-bearing space intermediate said continuous loop and said support body, means for supplying a source of pressurized air to said support body, means associated with the surface of said support body over which said continuous loop passes for supplying pressurized air to said air-bearing space from said support body, said air bags having upper surfaces which are inclined relative to each other, the lower surface of said continuous loop being V-shaped such that said continuous loop of flexibly coupled loop segments is centered between said air bags and supported thereon by two continuous air-bearing spaces intermediate said loop and said air bags, drive means operatively associated with said continuous loop for driving the same, and side-sealing means adapted to provide sealing contact between said continuous loop and said support body.

3,941,240
APPARATUS FOR OPERATING AUTOMATIC CONVEYORS

Otto Rasenberger, Goppingen, Germany, assignor to L. Schuler GmbH, Germany

Filed Feb. 21, 1974, Ser. No. 444,570
Claims priority, application Germany, Feb. 21, 1973, 2308539; July 7, 1973, 2334722
Int. Cl.² B65G *25/04*
U.S. Cl. 198—218 **12 Claims**



1. Apparatus for driving an automatic workpiece conveyor in a press train comprising:

drive means drivingly connectable to drive elements of a press,

a first linkage member connected directly to said drive means for movement therewith,

a second linkage member connected directly to a conveyor,

and a plurality of further linkage members articulated to one another and to said first and second linkage members such that movement of said drive means is transmitted by way of said linkage members to drivingly move said conveyor over a predetermined path including two standstill positions for accommodating pick up and delivery of workpieces being conveyed by the conveyor,

wherein said drive means is a rotatable member,

wherein said linkage members are configured such that a coupling point of two of said members is constrained to move in a predetermined path including two arcuate sections spaced from one another and having the same radius of curvature, said coupling point moving along one of said arcuate sections with said conveyor stopped at a first of said standstill positions and said coupling point moving along the other of said arcuate sections with said conveyor stopped at the other of said standstill positions,

wherein one of said members connected at said coupling point has the other end thereof connected to one end of a rocking lever which is rotatable about a fixed pivot axis intermediate the ends thereof, the other end of said rocking lever being connected to a linkage member drivingly connected to control movement of said conveyor in response to pivotal movement of said rocking lever about said fixed pivot axis,

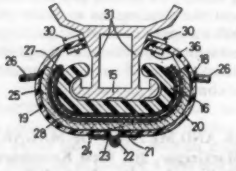
wherein a turning device is provided for turning a workpiece carried by said conveyor,

wherein a secondary linkage system is interconnected between said rocking lever and said turning device for driving said turning device, said secondary linkage system including a two-armed lever with guide means extending in the longitudinal direction thereof beyond the axis of rotation of said two-armed lever, a slide block being displaceably arranged in the guide means which carries a pin for the hinged connection of a coupling rod in the drive train for said turning device.

3,941,241
DEVICE FOR CLEANING MOVING BALUSTRADE BELT

Kinue Hishitani, No. 5-10, Irie, Aza Shimono-Ike, Nishimo, Itami, Hyogo, Japan

Filed Apr. 2, 1974, Ser. No. 457,342
Int. Cl.² B65G *45/00*
U.S. Cl. 198—230 **3 Claims**



1. An apparatus for cleaning the moving handrail supported by the sidewalls of an escalator and the like, said apparatus comprising:

wiping means in contact with said moving handrail for cleaning said handrail;

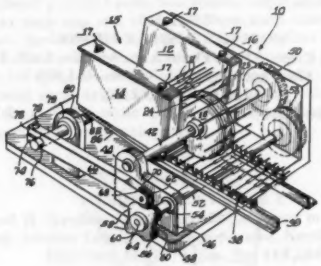
compartment means surrounding and spaced from said moving handrail and removably secured to said escalator sidewall for holding said wiping means in contact with said moving handrail, said compartment means having open ends for allowing said moving handrail to pass therethrough, and said compartment means comprised of:

two encasing halves surrounding said moving handrail;
spring hinge means for hinging said two encasing halves together and biasing both of said halves inward toward said handrail,
rims along the edges of each encasing half for containing said wiping means within said compartment means,
projections on the inside edges of each half opposite said hinge means for engaging with and removably securing said compartment means to said fastening means, and
two handles, one on each encasing half, to facilitate the positioning of said compartment means around said handrail and to facilitate the removal of said compartment means from around said handrail; and
fastening means attached to said escalator sidewall for receiving and securing said compartment means surrounding said handrail to said escalator sidewall, whereby said compartment means can be attached around and removed from around said handrail.

3,941,242
AXIAL LEAD COMPONENT FEEDER WITH ANTI-BUNCHING MECHANISM

Denver Braden, San Diego, Calif., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Dec. 12, 1974, Ser. No. 531,935
Int. Cl.² B65G *47/24*
U.S. Cl. 198—254 **4 Claims**

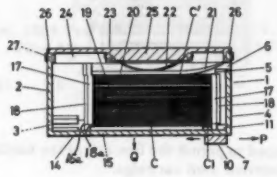


1. An axial lead feeding apparatus having an input end and an output end for feeding axial lead components to a conveying means comprising a magnetic feed bin having magnetic elements which supply a magnetic field that suspends said electrical components in said bin, a pick-up wheel for transferring said components from said feed bin to said conveying means having a plurality of pairs of notches on its periphery and a magnet associated with each of said notches for attracting the leads of said electrical components so that the leads of one of said components can be drawn into each pair of said notches, drive means for rotating said wheel adjacent the output end of said magnetic feed bin and rocking means synchronized with the rotation of said magnetic feed wheel for periodically rocking said magnetic feed bin in order to prevent bunching of said components and to maintain a satisfactory feeding distribution of said components in said feed bin, including means which contacts the input end of said feed bin and is constructed to periodically rock said input end of said feed bin up and down.

3,941,243
RAZOR BLADE CONTAINER FOR SINGLE EDGE BLADES FOR USE IN STRAIGHT EDGE TYPE RAZOR

Katsumi Yamada, No. 28, 2-chome, Kasuga-cho, Seki, Gifu Prefecture, Japan

Filed Feb. 27, 1975, Ser. No. 553,549
Claims priority, application Japan, Sept. 9, 1974, 49-103645
Int. Cl.² B65D *83/10*
U.S. Cl. 206—359 **4 Claims**



1. A blade container for single edge blades for a straight edge type razor with a replacable blade held in a blade holder, said container having opposite end walls, opposite side walls and top and bottom walls, said container having a blade attaching slot in one end wall adjacent one side wall for receiving the end of the blade holder, said container having a blade detaching slot in one end wall adjacent the other side wall and having a blade retaining projection in said blade detaching slot on the side of said slot away from said other side wall, a blade attaching slider slidable along said container toward and away from said blade attaching slot, said container having a blade compartment therein extending between said side walls in which blades are movable in a direction from one side wall to the other, said blade attaching slider having a pawl thereon projecting into said blade compartment for engaging a blade and moving it toward said blade attaching slot in alignment with a blade holder inserted thereinto, and blade support and guide means within said container adjacent said blade detaching slot spring urged in a direction through said compartment for urging blades in said compartment toward said side wall adjacent said blade attaching slot and having a shape for guiding a blade holder toward said side wall adjacent said blade attaching slot.

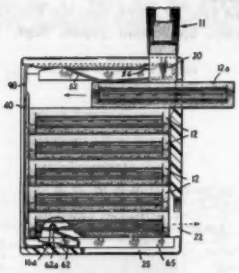
3,941,244
MAGAZINE FOR RAZOR BLADE CARTRIDGES

Paul A. Braginetz, Staunton, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Continuation of Ser. No. 364,715, May 29, 1973, abandoned. This application Feb. 12, 1975, Ser. No. 549,355
Int. Cl.² A45D *21/24*
U.S. Cl. 206—360 **11 Claims**

1. A magazine combination for razor blade cartridges of a generally oblong shape comprising a housing, a stack of cartridges arranged flatwise each against an adjacent one therein, said housing having a front end wall with a first opening at one end of the wall thereof for the endwise insertion of a used cartridge, and a second opening at the other end of the wall for endwise extraction of a new cartridge, and elastic means arranged to urge the stack toward said second opening, a rigid stop means against which the stack and the end new cartridge are normally maintained by said elastic means, the end cartridge being fully exposed at said second opening for endwise extraction, said elastic means comprising a pair of laterally spaced spring fingers with a slot between to receive a razor

handle part slidable therein, and said housing having a back end wall with an exit opening opposite said first opening in the



front wall shaped to permit the free exit of the handle part but restrain the inserted used cartridge.

3,941,245

STERILE CONTAINER FOR ENCLOSING A CONTAMINATED ARTICLE THEREIN

Maynard F. Oliverius, 4020 Sena Drive, Topeka, Kans. 66606

Filed Mar. 25, 1974, Ser. No. 454,761
Int. Cl.² B65D *33/20*
U.S. Cl. 206—438 11 Claims

1. A sterile container adapted to receive a non-sterile article and comprising:

a. walls defining a container having a closed end and an open end, said container having closed sides;

b. a cuff on said container and in overlying relation with said walls adjacent the open end of said container;

c. walls defining a second container having a closed end and an open end, said second container having the closed end thereof positioned within said first named container, said walls of said second container extending from within said first named container and having outer portions thereof in overlying relation with said cuff adjacent the open end of said first named container whereby said walls of said second container protect said first named container and said cuff from contact with a non-sterile article moved into said first named container; and

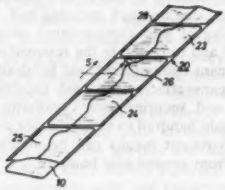
d. means on said walls of one of said first named container and said second container for sealing said first named container whereby a non-sterile article moved into said second container may be sealed in said first named container after movement of said second container and article into said first named container to thereby provide a sterile package of a non-sterile article which may then be safely introduced into a sterile area.

3,941,246

PACKAGE FOR RADIOGRAPHIC FILMS

Emanuel Hubert Duden, Mortsel, Belgium, assignor to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Apr. 19, 1974, Ser. No. 462,544
Claims priority, application Belgium, Oct. 23, 1973, 5448
Int. Cl.² B65D *27/10, 85/00*
U.S. Cl. 206—455 9 Claims



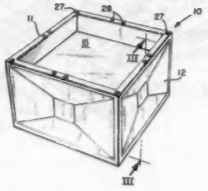
1. A continuous belt package for a multiplicity of sheet-like materials from which the sheet-like materials can be removed one by one without disrupting the belt continuity, comprising a continuous supporting web of a width somewhat exceeding the material width, a top web constituted of two continuous strips arranged in overlapping relation along their mutually inner edges and having an overall width generally equal to said supporting web, a multiplicity of said materials disposed in lengthwise spaced relation between said webs, the margins of said webs around the periphery of the individual materials being sealed together, at least one of said webs having a zone of weakness around the material periphery to permit the same to be separated from the remainder of the belt package for removal of the individual materials therefrom.

3,941,247

MODULAR DISPLAY MEANS

Robert W. Cripe, 339 E. Floral Ave., Arcadia, Calif. 91006

Filed Apr. 18, 1974, Ser. No. 461,926
Int. Cl.² B65D *21/02*
U.S. Cl. 206—511 2 Claims



1. A lightweight preformed environment resistant dimensionally stable rigid modular display block adapted for use with like blocks for exhibiting sundry products and adapted to be arranged for different display conditions, comprising the combination of:

a homogeneous one-piece seamless polyhedral rigid hollow block body of plastic material having smooth, mar and soil resistant exterior surfaces,

said body having side walls with top edges lying in a plane,

a bottom wall,

a top wall spaced below said plane and having peripheral portions uniformly spaced interiorly of said side walls,

and recess walls and top edge walls of uniform narrow width joining said top wall and side walls adjacent the peripheral top edges of the side walls,

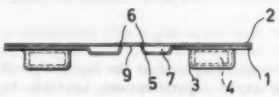
said recess walls, top edge walls, and top portions of said side walls forming an inverted peripheral channel section of material for dimensionally rigidifying a top upstanding peripheral wall portion which extends continuously around the periphery of the block body and which defines

a recess pocket of selected depth for containing objects to be displayed;
said bottom wall having an exterior virtually planar surface;
each of said side walls in cross section having a slightly concave configuration for stiffening said block body;
and means including holes formed in peripheral top edge walls and means including corresponding projection on said bottom wall to releasably interlock one block body with at least a portion of another like block body.

3,941,248
CHILDPROOF PACKAGING FOR TABLETS

Theo Moser, Neckarrems, and Dieter Liede, Moglingen, both of Germany, assignors to Robert Bosch Verpackungsmaschinen G.m.b.H., Waiblingen, Germany

Filed Sept. 6, 1973, Ser. No. 394,770
Claims priority, application Germany, May 2, 1973, 2322055
Int. Cl.² B65D *83/04, 85/56*
U.S. Cl. 206—531 **1 Claim**

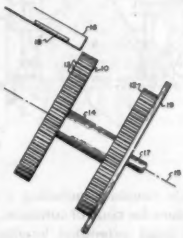


1. A childproof package assembly comprising a base foil made of thermoplastic synthetic material and equipped with deep-drawn cups disposed in a linear array for receiving plural, spaced tablets, dragees or the like therein, said cups being spaced from each other by a planar portion of said base foil, said planar portion having two shallow depressed areas adjacent to each cup and separated from each other by a web portion, perforations disposed at the extremities of said web in a direction transverse to the linear array, a coextensive cover foil lying in a single plane covering said cups and said depressed areas to permit removal of an individual package from the assembly while retaining an adjacent cup inaccessible by the remaining web portion.

3,941,249
AXIAL SORTING DEVICE

Michael H. Grunsten, Oak Park, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Oct. 11, 1974, Ser. No. 514,164
Int. Cl.² B07C *1/14*
U.S. Cl. 209—104 **2 Claims**



1. An axial sorting apparatus comprising:
first and second circular rotatable discs disposed parallel to each other and centered on a common axis, each of said discs having a plurality of slots on its outer rim;
at least one spacer separating said discs and secured on its center through said axis to the inside surfaces of said first and second rotatable discs;
backstop means positioned against the outside surface of said second rotatable disc and having a diameter greater than said second rotatable disc;
component delivery means positioned outside of said first rotatable disc;
deflector means disposed between said discs for separating the undersized component which falls between said discs and the proper sized components, said deflector means comprising two substantially perpendicular planar surfaces intersecting along a line parallel to and displaced from the axis of the spacer and extending downwardly.

3,941,250
FOLDABLE SUPPORT

Walter Ott, 3886 Pearl St. Road, Batavia, N.Y. 14020

Filed Mar. 17, 1975, Ser. No. 559,335
Int. Cl.² A47B *53/00*
U.S. Cl. 211—1.3 **3 Claims**

1. A foldable support, comprising:
an elongated vertical housing adapted to be mounted on a vertical wall and having a channel-shaped transverse cross-section formed by a pair of transversely spaced vertical flanges separated by an intermediate vertical web having a forwardly facing planar surface, said flanges and web defining an elongated recess therebetween, each of said flanges being vertically tapered such that its horizontal depth decreases with height above the bottom of said housing, each of said flanges being provided with a transversely extending through opening at a lower portion thereof; and
an arm having one end portion pivotally mounted on said housing and having another portion continuing outwardly therefrom to the distal end of said arm, said arm being adapted to be selectively moved between a raised position at which said arm is received in said recess, and a lowered position at which said arm projects horizontally outwardly from said housing, said arm one end portion having a substantially U-shaped transverse cross-section terminating in a planar end face surface and having a trunnion extending transversely outwardly from each parallel leg of said one end portion, each of said trunnions having a cylindrical surface tangential to both the end face and the upper surface of its associated leg, said arm being complementarily tapered with said housing flanges to enable said arm to be moved through an arc greater than ninety degrees,
whereby, when said arm is in said lowered position, the entire end face surface of said arm one end portion engages said housing web surface for distributing the force exerted by said housing on said arm end face to resist the moment of an object hanging from said arm other portion.

3,941,251

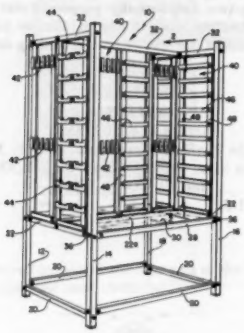
DISPLAY FIXTURE

Elliott H. Izen, Newton, Mass., assignor to Crystal Craft Plastics Company, Inc., Central Falls, R.I.

Filed Oct. 15, 1974, Ser. No. 515,101

Int. Cl.² A47F 5/10

U.S. Cl. 211—177 4 Claims



1. A display fixture comprising a plurality of vertically disposed stanchions, upper and lower horizontally disposed channel members connected to and extending between said stanchions, said upper channel member having a downwardly disposed open portion extending along its length and said lower channel member having an upwardly disposed open portion extending along its length, and a plurality of separate display racks removably mounted between said channel members, said racks being dimensioned so that the top of each rack may be inserted into the open portion of the upper channel member and then the bottom of each rack swung into alignment with the open portion of the lower channel member and dropped therein whereby when the rack comes to rest in said lower channel member, the top edge of the rack is still retained within the upper channel member, and means on said racks for mounting articles to be displayed, said racks being slidable along said channel members, and said racks each having a bearing strip secured to and extending horizontally thereacross adjacent to but spaced from the bottom edge of the rack, said bearing strip engaging the top of the lower channel member to limit downward movement of the rack therein, whereby said bearing strip rides on the top of said lower channel member when the racks are slidably moved, the dimension from the bottom edge of each of said racks when in said channel members to the open portion in the upper channel member being substantially less than the dimension from the innermost end of the lower channel member to the open portion in the upper channel member, and the dimension from the bottom edge of said bearing strip on each rack to the top edge of said rack being greater than the dimension from the open portion in the lower channel member to the open portion in the upper channel member but less than the dimension from the open portion in the lower channel member to the innermost end of the upper channel member.

3,941,252

CRANE WITH REMOVABLE SUPERSTRUCTURE

John W. Six, Hixson, and Virgil F. Kramer, Signal Mountain, both of Tenn., assignors to Koehring Company, Milwaukee, Wis.

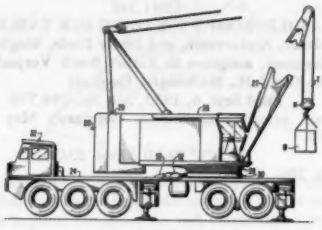
Filed Jan. 23, 1975, Ser. No. 543,501

Int. Cl.² B66C 23/84

U.S. Cl. 212—69 15 Claims

1. In a large self propelled mobile crane of the type having a wheeled carrier supporting a revolvable superstructure provided with a boom carrying a load engaging tool and means for raising and lowering said tool, improved means for detachably securing said revolvable superstructure to said carrier so as to hold said superstructure firmly in place during operation of said tool and so as to permit convenient detachment of said superstructure from said carrier when it is desired to move the crane from one site to another, the improvement comprising:

mounting means carried by the carrier, being operable to support the revolvable superstructure, and having a first generally radial protrusion;



attachment means disposed at the bottom portion of the revolvable crane superstructure, operable to be supported by said mounting means, and including a second generally radial protrusion;

segmented clamp means for engaging said first generally radial protrusion and said second generally radial protrusion and fastening said mounting means and said attachment means together; and

means to move the segmented clamp means to and from a clamping position in which the segmented clamp means fastens the first and second generally radial protrusions.

3,941,253

RAIL VEHICLE COUPLER WITH CABLE COUPLING

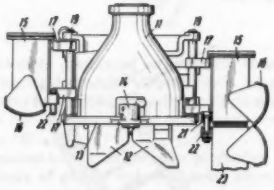
Klaus Ksiensyk, Remscheid-Lennep, and Barun Kumar Chatterjee, Remscheid, both of Germany, assignors to Bergische Stahl-Industrie, Remscheid, Germany

Filed Mar. 26, 1975, Ser. No. 562,236

Claims priority, application Germany, Mar. 26, 1974, 2414384

Int. Cl.² B61G 5/06

U.S. Cl. 213—1.3 6 Claims



1. A rail vehicle coupling including a coupling head and cable coupling means for control conduits, a pair of guide rods on the coupling head extending longitudinally thereon in coupling direction, said cable coupling means comprising a coupling box slidably supported on said rods and adapted for cooperation with a like coupling box on another coupling head during a coupling operation, said coupling box having members thereon formed with eyes slidably engaging said rods, each said member comprising first and second parts and resilient means interposed between said parts for resiliently supporting the respective eye on said coupling box.

3,941,254

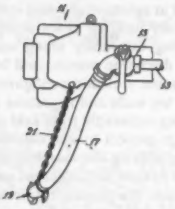
WIRE FORM LOCKING MEANS FOR DETACHABLE AIR HOSE COUPLINGS OF RAILWAY CARS

Theodore J. Sweger, Lake Worth, Fla., assignor to Illinois Railway Equipment Company, Chicago, Ill.

Continuation-in-part of Ser. No. 495,320, Aug. 7, 1974, abandoned. This application Dec. 17, 1974, Ser. No. 533,669

Int. Cl.² F16L *35/00*

U.S. Cl. 213—76 10 Claims



1. For combination with a pair of air hose couplings at the juxtaposed ends of railway cars, said hose couplings being coupled by relative pivotal movement in a coupling direction, and likely to become uncoupled by accidental relative pivotal movement in an uncoupling direction, each hose coupling having a body and a lip latchable to the lip and body respectively of the other air hose coupling; resilient wire form locking means for reacting between the body of one air hose coupling and the lip of the other air hose coupling to prevent relative pivotal movement of said air hose couplings in said uncoupling direction, said wire form having a shoulder portion for reacting against one end of said lip and an extension for reacting against one side of said body, said wire form having a section intermediate said shoulder portion and said extension for encircling a portion of the respective air hose coupling to secure it thereto.

3,941,255

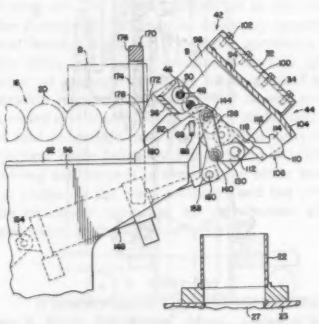
ARTICLE TURNING DEVICE

Siegfried G. Wolf, Salem, Ohio, assignor to Gulf & Western Manufacturing Company, Southfield, Mich.

Filed Nov. 25, 1974, Ser. No. 526,745

Int. Cl.² B65G *47/24*

U.S. Cl. 214—1 QG 19 Claims



1. A device for turning an article from a generally horizontal disposition to a generally vertical disposition comprising, frame means, article support means having opposite ends and mounted on said frame means for pivotal movement about a horizontal axis transverse to the direction between said ends and between first and second positions in which an article on said support means is respectively in said horizontal and vertical dispositions, one of said opposite ends being a discharge end and being disposed below the other end when said support means is in said second position, article stop means pivotally mounted on said support means at said discharge end and engaging and supporting said article during movement of said support means from said first toward said second position, means to pivot said support means about said horizontal axis from said first position toward said second position, and means to pivot said stop means to release said article from said support means as said support means approaches said second position.

3,941,256

BAR FEEDERS

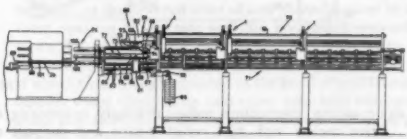
Ewart H. Doe, Stockbridge, and William J. Linforth, Chandlers Ford, both of England, assignors to Twyford Moors (Aircraft & Engineering Limited), Eastleigh, England

Filed July 12, 1974, Ser. No. 487,953

Claims priority, application United Kingdom, Aug. 21, 1973, 39498/73

Int. Cl.² B65H *51/26*

U.S. Cl. 214—1.4 18 Claims



1. A bar holder and feeder for an automatic machine tool comprising:

a. an elongated bar holder aligned with the machine tool, which bar holder can be opened to allow bar to be loaded thereinto;

b. loading means comprising a pair of opposed jaws between which jaws the bar can be engaged and means to move said jaws to locate the bar in a loaded position in said bar holder; and

c. a bar feeder positioned between the elongated bar holder and the machine tool, through an open collet of which machine tool bar is to be fed from the bar holder,

d. the bar feeder comprising a sleeve engageable over a bar to be fed at a position externally of the machine tool and feed means to cause axial movement of said sleeve,

e. said sleeve having internal biased gripping means which permit said sleeve to be moved by said feed means over the bar in a direction away from said machine tool but prevent said sleeve being moved by said feed means over the bar in a direction towards said machine tool, whereby a reciprocation of said sleeve by said feed means causes the bar to be fed to said machine tool,

f. means to cause said pair of opposed jaws of said loading means to grip the bar in said loaded position to prevent movement of the bar from said loaded position in a direction away from said machine tool, and

g. means to move said sleeve in a direction away from said machine tool to engage said sleeve over the end of the bar nearer said machine tool.

3,941,257

MULTI-STAGED AUTOMOBILE PARKING APPARATUS

Takashi Matsuura, 28-4 Izumi 2-chome, Suginami, Tokyo, Japan

Filed Mar. 5, 1974, Ser. No. 448,432

Claims priority, application Japan, June 12, 1973, 48-66176; Sept. 16, 1973, 48-104186; Oct. 12, 1973, 48-114455

Int. Cl.² E04H *6/06*

U.S. Cl. 214—16.1 ED 9 Claims

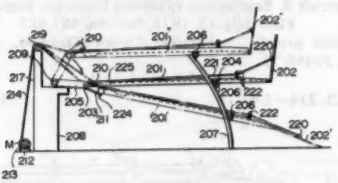
1. A multi-stage automobile parking apparatus which comprises:

pallet means for receiving and supporting an automobile thereon;

support arm means, means mounting said support arm means to rotate about a horizontal axis at one end thereof and connecting its other end to one end region of said pallet means,

first pallet guide means on said support arm means to facilitate pivotal movement of one end of said pallet means about said horizontal axis and sliding movement of one end of said pallet means thereon in the longitudinal direction thereof;

second pallet guide means for guiding said pallet means at an opposite end region thereof and defining a predetermined path of movement for said opposite end region of the pallet, means on said pallet means for engaging said first and second guide means;



drive means, connection means drivingly connecting said drive means with said pallet means and support arm means to bring about rotation thereof about said horizontal axis such that one end of said pallet means rotates with respect to the support arm means about said horizontal axis while the opposite end region of the pallet travels along said predetermined path of said second guide means so that said pallet means is maintained substantially horizontal during rotation of the support arm means about said horizontal axis; and

auxiliary plate means, hinge means connecting said auxiliary plate means to said pallet means at one end thereof remote from said support arm means, connecting means connecting said auxiliary plate means with said support arm means such that said auxiliary plate means is pivoted between a first and second position in response to movement of said support arm means.

3,941,258

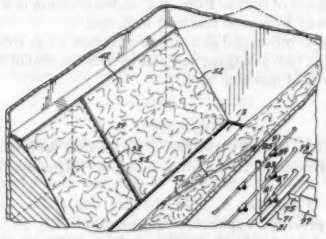
METHOD AND APPARATUS FOR STORING AND UNLOADING BULK MATERIAL

Allan R. Ide, 10066 Bloomfield, Cypress, Calif. 90630

Filed Feb. 4, 1974, Ser. No. 439,399

Int. Cl.² B65G 65/40

U.S. Cl. 214—17 D **4 Claims**



1. Bulk storage and unloading apparatus for handling a selected granular material having a predetermined angle of repose and including:

storage means including a substantially horizontal bottom wall having upstanding opposite end walls and at least one side wall rising upwardly therefrom to form a storage compartment;

discharge means in said bottom wall and spaced from said side wall a distance sufficient to cause said material, when draining hereinto under the influence of gravity, to form an angle of repose leading upwardly therefrom to a selected level at said side wall;

a bladder device including a liner extending substantially the full length of said compartment affixed at one edge to said side wall at substantially said selected level or thereabove, normally hanging down along said side wall and then projecting outwardly along said end and bottom walls to said discharge means, said bladder device being shaped to assume a loaded configuration lining said bottom end and top walls and to assume an unloaded configuration bulging outwardly from said side wall and turning downwardly to project to said discharge means;

fastening means affixing the marginal edges of said bladder device to said bottom wall adjacent said discharge means;

pressurizing means for pressurizing said bladder device to progressively balloon the upper portion of said bladder device outwardly away from said side wall to roll the uppermost material resting against said bladder outwardly away from said side wall and to then, upon continued inflation, progressively continue bulging said bladder outwardly at its upper portion to continue rolling said material outwardly away from said side wall toward said discharge means to finally bulge the bottom portion of such bladder device away from said side and bottom walls to assume said unloaded position.

3,941,259

DEVICE FOR RELOCATING FUEL ELEMENTS AND CONTROL RODS IN A CORE REACTOR

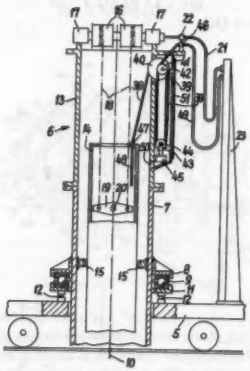
Bernhard Hoffmeister, and Wilhelm Schwarz, both of Wilhelmshaven, Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter, Haftung, Essen, Germany

Filed Dec. 26, 1974, Ser. No. 536,354

Claims priority, application Germany, Feb. 21, 1974, 2408261

Int. Cl.² B66C 19/00

U.S. Cl. 214—27 **11 Claims**



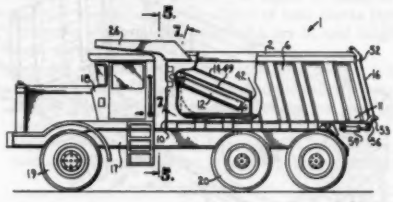
1. Apparatus for relocating fuel elements and control rods in a core reactor in which a tubular mast is rotatable on a vertical axis on a horizontally movable platform and is provided with a gripper body, said apparatus including means nonrotatably but reciprocably guiding said gripper body for vertical movement in said mast, lift cable means connected to

the gripper body and flexible conduit means also connected to the gripper body, drive means for the cable means and storage means for the conduit means said drive means and storage means being carried by said mast and rotating with the mast when the mast rotates about said axis.

3,941,260
MATERIAL CARRYING VEHICLE

Don H. Fisher; Harold Coons, and Jackie Highfill, all of Kansas City, Mo., assignors to ISCO Manufacturing Company, Inc., Kansas City, Mo.

Filed Oct. 15, 1974, Ser. No. 514,799
Int. Cl.² B60P *1/00*
U.S. Cl. 214—82 **10 Claims**



1. A material carying vehicle comprising:

a. an elongated mobile body having a forward end and a rear end and having a bottom wall and laterally spaced side walls extending upwardly from the bottom wall to define a generally channel shaped structure having an open top;

b. first and second laterally spaced elongate wear members mounted on the bottom wall of said body;

c. an ejection blade within said body and having an upper edge and a lower edge and opposite side edges, said ejection blade being transverse of said body and having each of the side edges thereof in close proximity to a respective one of said side walls of said body;

d. spaced first and second elongate bearing plates on said ejection blade and each extending longitudinally of and slidingly engaging a respective one of said wear members to movably support said ejection blade with the lower edge thereof in close proximity to said bottom wall of said body; and

e. first and second laterally spaced extensible members each having one end thereof connected to said body adjacent the forward end thereof in upwardly spaced relation to said bottom wall, said extensible members each having the other end thereof connected to said ejection blade adjacent respective bearing plates thereof with said extensible members being inclined downwardly from the forward end toward said ejection blade, said connections of said extensible members with the body and with the ejection blade being by free floating mounting with the guiding and support of the ejection blade being the bearing plates on the wear members and the connections to the extensible members for an absence of binding in movement of the ejection blade.

3,941,261
WHEEL CHAIR CARRYING MINIBUS

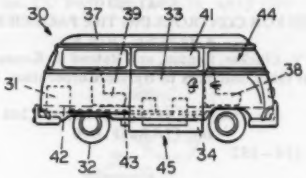
William S. Ricci, Dorchester, Mass., assignor to H. P. Bus Corporation of America, N. Billerica, Mass.

Filed Oct. 21, 1974, Ser. No. 516,270
Int. Cl.² B65G *67/02*
U.S. Cl. 214—85 **11 Claims**

1. In a vehicle of the "Volkswagen minibus" type having at least one side door slideable in a lower track, and conventional height seats, windows and floor the combination of:

wheel chair support means on said vehicle, said means comprising:

lowered floor means, located between the conventional driver's seat and the conventional passenger seats within said vehicle, said lowered floor means including a side wall, an opposite side wall with a ramp opening and a planar bottom, said bottom extending from side to side of said vehicle at a predetermined level below the level of said conventional floor and



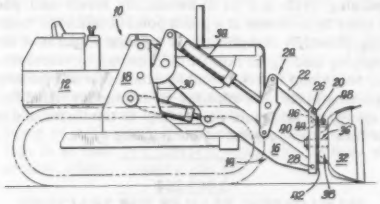
wheel chair ramp means, including a normally upstanding wheel chair ramp mounted on a fixed pivot located substantially at the lowered level of said planar bottom in the ramp opening in said side wall, for pivoting downwardly when the adjacent side door is slideably opened to an inclined position to support a wheel chair,

said wheel chair being supported at the level of said lowered bottom when wheeled up said ramp onto said bottom in order that the eyes of the occupant thereof will be at the level of the windows of said vehicle.

3,941,262
PIVOTALLY DISPOSABLE BUCKET

Raymond L. Moser, Tremont, and Everette Michael Volle, Morton, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 1, 1974, Ser. No. 438,669
Int. Cl.² E02F *3/81*
U.S. Cl. 214—145 R **3 Claims**



1. In combination with an earthmoving machine including a vehicle having a bucket which includes a standard cutting edge and means interconnecting the bucket and said vehicle, the improvement comprising:

mounting means associated with said bucket and means interconnecting the bucket and vehicle to permit earthmoving operations of the vehicle, said mounting means comprising a bracket operatively connected with the vehicle, bearing means secured to the bucket and defining a bore, and a retaining pin member secured to the bracket and accepted in said bore and engaging said bearing means, so that the bucket may be rotated about an axis of rotation defined by the retaining pin member;

the bucket further comprising first and second end-wall members, one of said end-wall members defining a second cutting edge thereon;

the axis of rotation being positioned to allow rotation of the bucket to a position wherein engagement of the standard

cutting edge with a work surface is allowed, and to allow rotation of the bucket to a substantially different position wherein engagement of the second cutting edge with said work surface is allowed;

the mounting means serving to securely mount the bucket to permit the earthmoving operations in both rotative positions; and,

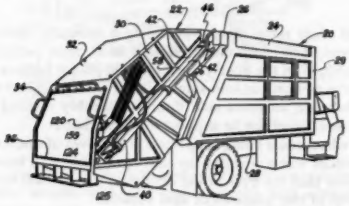
means for positionally selectively locking the bucket in both rotational positions.

3,941,263

METHOD FOR CONTROLLING THE PACKER BLADE OF A REFUSE TRUCK

Richard V. Clucker, Kenton, and Roland R. Kennedy, Galion, both of Ohio, assignors to Harsco Corporation, Camp Hill, Pa.

Filed Aug. 14, 1974, Ser. No. 497,246
Int. Cl.² B65F 3/00
U.S. Cl. 214—152 2 Claims



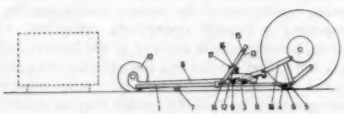
1. The steps in the method of controlling the packing action of rear loader type refuse truck of the type that includes a packer body provided with a load receiving opening and a movable packer blade means cycled through said body for packing refuse therein, said method comprising applying a main power flow of fluid energy from a main power flow circuit to said packer blade to actuate said packer blade through said packing cycle; controlling said main power flow with a signal flow of fluid energy from a separate signal flow circuit so as to move said packer blade through a portion of the packing cycle and to automatically arrest said packer blade prior to its arrival at a pinch point at said load receiving opening; manually energizing said separate signal flow circuit for applying said signal flow of fluid energy to reactuate said packer blade and thereby complete the cycle of operation of said packing blade; and applying an emergency signal flow of fluid energy to said main power flow to terminate said main power flow at any portion of the packing cycle.

3,941,264

SELF-LOADING TRAILER FOR TRACTORS

Julio Cesar Santos da Silva Bento, Rua Sao Joao de Brito, Linda-a-Velha, Portugal

Filed Aug. 15, 1[illegible] /4, Ser. No. 497,637
Claims priority, application Portugal, Aug. 17, 1973, 60405
Int. Cl.² B60P 1/44
U.S. Cl. 214—390 5 Claims



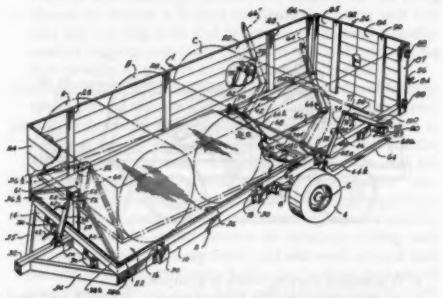
1. A self-loading trailer to couple with farm tractors, having hydraulically moved rear bars comprising, in combination, two mechanical frames articulated together and forming a pivot; a tractor rear towing device; one of the frames defining a horizontal load plan and extending forward to couple with said tractor rear towing device; the other frame comprising a multiplying force lever of second order and supported on the ground on its rear end, said lever being actuated on its front end by the tractor's hydraulically moved rear bars and applying the multiplied tractor hydraulic force between its two ends to the first frame on said pivot.

3,941,265

LOADING APPARATUS FOR ROUND BALES

Marion Diehl Nunnally, Jr., Rte. 4, Jacksonville, Tex. 75766

Filed Dec. 2, 1974, Ser. No. 528,911
Int. Cl.² B60P 1/44
U.S. Cl. 214—505 6 Claims



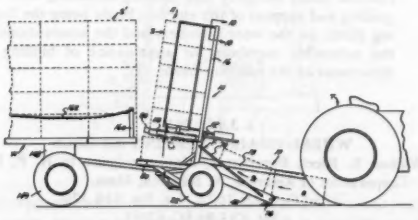
1. Bale handling apparatus comprising: a vehicle having a front end and a rear end; a floor; means pivotally securing the rear end of said floor to said vehicle; said floor terminating intermediate the front and rear ends of the vehicle; elevating means secured between said vehicle and the front end of said floor; spaced forks; means pivotally securing said forks to said vehicle adjacent the rear end of the floor; actuating means secured between said vehicle and said forks, said actuating means being adapted to pivot said forks between a first position wherein ends of said forks are adjacent the ground and a second position wherein ends of said forks are at an elevation above said floor; bale engaging means; and means securing said bale engaging means to the rear end of said vehicle, said bale engaging means extending transversally of said vehicle and rearwardly of ends of said forks such that an opening is formed between the rear end of the floor and the bale engaging means, said forks being movable through said opening.

3,941,266

BALE LOADING AND STACKING APPARATUS

Allan R. Havens, 821 W. Knox Road, Beaverton, Mich. 48612

Division of Ser. No. 227,850, Feb. 22, 1972, Pat. No. 3,807,579. This application Aug. 20, 1973, Ser. No. 389,494
Int. Cl.² B65G 57/32; A01D 87/12
U.S. Cl. 214—518 6 Claims



1. Bale loading and stacking apparatus comprising:

a mobile platform, such as a wagon or the like, for supporting stacks of bales and adapted to be moved forwardly in

a longitudinal path of travel, said platform having a plurality of longitudinally extending, laterally spaced apart stripping fingers thereon;

a portable framework adapted to be moved forwardly in a longitudinal path;

a plurality of longitudinally extending, laterally spaced support members on said framework having rearwardly opening, open-ended slots therebetween longitudinally aligned with the stripping fingers;

draft bar connection means connecting said platform to said framework for longitudinal forward movement therewith but permitting relative movement of said platform and said framework between spread and less spread positions to move said fingers and said support members between longitudinally spaced and generally superposed positions;

means for delivering a plurality of stacks of bales to said support members to form a row of bale stacks thereon when the platform and framework are in said longitudinally spread positions; and

means for vertically moving at least one of said support members and said fingers relative to the other to pass said support members through the openings on said framework and transfer said row of stacked bales from said support members to said fingers when said wagon and said support members are in said superposed positions.

3,941,267

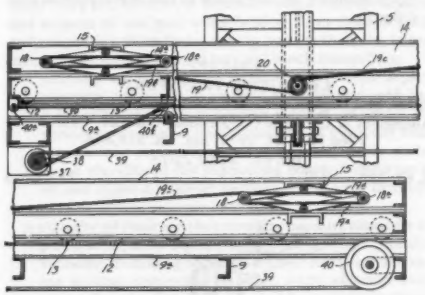
MOBIL LOAD RAISING STRUCTURE

Logan C. Greeson, Madison, Ga., assignor to Hi Bridger, Inc., Madison, Ga.

Filed June 6, 1974, Ser. No. 477,105

Int. Cl.² B66F 9/14

U.S. Cl. 214—730 **3 Claims**



1. A mobile load raising structure comprising a mobile platform, towers mounted on said platform in spaced apart relationship and extending upright with said platform, a load supporting member extending between and beyond said towers and slideably mounted on said towers for movement longitudinally thereof, means for raising and lowering said load supporting member upwardly and downwardly of said towers, said load supporting member comprising a frame extending laterally between said towers, C-shaped beams being mounted on and extending laterally of said frame, a load carrier frame extending laterally of said first frame, rollers rotatably mounted on said load carrier frame and riding in said C-shaped beams, a second load carrier frame detachably positioned on said first load carrier frame, a plurality of scissor jacks pivotally connected to said first and second load carrier frames and means for operating said scissor jacks for raising and lowering said second load carrier frame relative to said first load carrier frame, and means for moving said first load carrier longitudinally of said C-shaped beams, further wherein said means for operating said scissor jacks includes rollers rotatably mounted on the medial pivots of said jacks, at least one cable extending over said rollers and having its ends attached to one of the rollers of each of said scissor jacks and a driven roller mounted on said first load carrier frame and having said cable extending therearound.

3,941,268

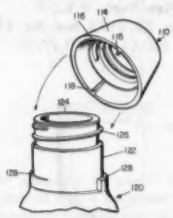
SAFETY CLOSURE AND CONTAINER

Edward W. Owens, Shippenville, Pa., and Ned J. Smalley, Perrysburg, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Jan. 8, 1975, Ser. No. 539,262

Int. Cl.² B65D 55/02, 85/56; A61J 1/00

U.S. Cl. 215—216 **3 Claims**



1. A double-locking, child-resistant closure and container combination comprising:

a container having a generally cylindrical neck portion with threads formed on the exterior thereof, and a pair of camming projections formed on diametrically opposite sides of said threaded neck portion; and

a closure having a top panel and a tapered annular skirt portion depending therefrom, said annular skirt including threads formed on the interior surface thereof adapted to matingly engage the threads on the neck portion of said container, a pair of locking lugs formed on diametrically opposite sides of the interior surface of said annular skirt, said locking lugs being positioned for locking engagement with said camming projections to prevent removal of said closure from said container neck when said closure is in threaded engagement with said container neck, said tapered annular skirt being flexible to permit purposeful squeezing thereof at locations spaced 90° from said locking lugs to displace said locking lugs outwardly beyond said camming projections to permit rotation of said closure relative to said container neck to thereby remove the closure from threaded engagement with the container, said pair of camming projections on said container neck being of sufficient height to engage said pair of locking lugs in at least two different rotational positions of the closure relative to said container.

3,941,269

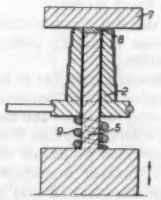
BOTTLE CAPSULES

Valer Flax, Place Mahomme, 32190 Vic-Fezensac, France

Filed Mar. 27, 1974, Ser. No. 455,044

Int. Cl.² B65D 41/54

U.S. Cl. 215—246 **4 Claims**



1. A capping capsule made of a synthetic plastics material for sealing attachment to the neck portion of a container, said

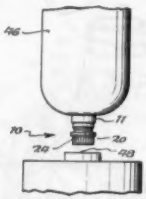
capsule comprising: a base wall portion in the form of a planar disc; and a heat-shrinkable tubular side wall portion having a substantially uniform wall thickness extending from the periphery of the base wall portion integral therewith and made of the same material as the base wall portion, the base wall portion being thicker than the tubular side wall portion and having a peripheral outline smaller than the peripheral outline of the interior of the side wall portion.

3,941,270

REMOVABLE SEAL FOR LIQUID CONTAINERS

Burton A. Spielman, Chatham, N.J., assignor to Allied Chemical Corporation, New York, N.Y.

Filed Jan. 25, 1974, Ser. No. 436,766
Int. Cl.² B65D 51/16
U.S. Cl. 215—261 **7 Claims**



1. A removable seal for liquid containers comprising:
a cylindrical member having first and second open ends, an internal hollow portion and an external male thread proximate the first end thereof;
a screw closure comprising a top wall and a continuous side wall, said side wall being attached to and extending from the edges of said top wall, said side wall being internally provided with a female thread for engagement with the male thread of said cylindrical hollow member said top wall having a perforate portion permitting communication through the top wall;
a flexible liquid impervious sealing member for engagement with and for sealing the first end of the cylindrical hollow member, said flexible member being held against said first end by the top wall of the screw closure, permitting disengagement of the sealing member from the first end of the cylindrical hollow member by application of pressure upon the sealing member through the perforate portion of the top wall.

3,941,271

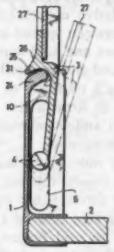
COLLAPSIBLE RECEPTACLE

Walther Zarges, Murnau, and Frank Zarges, Soecking, both of Germany, assignors to Walther Zarges, Germany

Filed Sept. 11, 1972, Ser. No. 287,792
Claims priority, application Germany, Sept. 11, 1971, 2145550
Int. Cl.² B65D 7/26
U.S. Cl. 220—6 **21 Claims**

14. A collapsible receptacle comprising:
at least one base frame means,
and at least one sidewall means slidably connected to said base frame means between a collapsed position and an assembled position,
wherein each sidewall means has at least a first outwardly directed projection means constructed as water guide means for directing rainwater and the like outwards of the receptacle and wherein said base frame means has at least one inwardly directed projection means, said at least a first outwardly directed projection means overlaps at least a corresponding one of said at least one inwardly directed projection means when the receptacle is in an assembled and non-collapsed condition, said overlapping inwardly and outwardly directed projection means serving to maintain the receptacle in said non-collapsed condition.

16. A collapsible receptacle comprising:
at least one base frame means,
and at least one sidewall means slidably connected to said base frame means between a collapsed position and an assembled position,
wherein said base frame means has a plurality of oblong holes in which said sidewall means is slidably connected,



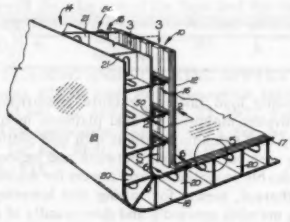
each sidewall means has at least a first outwardly directed projection means and said base frame means has at least one inwardly directed projection means, said at least a first outwardly directed projection means overlaps at least a corresponding one of said at least one inwardly directed projection means when the receptacle is in an assembled and non-collapsed condition, said overlapping inwardly and outwardly directed projection means serving to maintain the receptacle in said non-collapsed condition.

3,941,272

CRYOGENIC TRANSPORT

Hollis G. McLaughlin, Walnut Creek, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Mar. 27, 1974, Ser. No. 455,445
Int. Cl.² B65D 25/18
U.S. Cl. 220—9 LG **23 Claims**



1. A system for anchoring a cryogenic liquid holding tank of aluminum metal construction to and integrating such tank with an outer envelope-like supporting structure of ferrous metal comprising the combination of an aluminum cryogenic liquid holding tank, cryogenic insulation secured to the interior metal surfaces of the cryogenic liquid holding tank, a ferrous metal envelope-like supporting structure encompassing in spaced relation at least the major outer surface portions of the cryogenic liquid holding tank and transition connector means anchoring the aluminum cryogenic liquid holding tank to and fully integrating the said tank with the ferrous metal envelope-like supporting structure to form a composite stress resistant unit, said transition connector means including bonded together composite aluminum and ferrous metal transition stringer inserts interposed between the tank and said

supporting structure the aluminum portion of an insert being directly and rigidly connected to the outer surfaces of the aluminum cryogenic liquid holding tank while the ferrous metal portion of an insert being directly and rigidly connected to the ferrous metal envelope-like supporting structure.

3,941,273

BASKET FOR HANDLING MACHINE PARTS

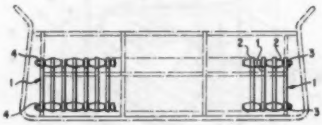
Andre Dalencon, Paris, France, assignor to Regie Nationale des Usines Renault, Billancourt and Automobiles Peugeot, XVieme, both of France

Filed Dec. 12, 1973, Ser. No. 426,665

Claims priority, application France, Dec. 12, 1972, 72.44149

Int. Cl.² B65D 7/20

U.S. Cl. 220—19 4 Claims



1. A basket for handling heavy machine parts having an outer body and an internal block forming a rack for separation and support of said part while holding them fixed in position and preventing them from striking one another, the improvement characterized by said internal block comprising:

a plurality of transversely extending wall-type separator elements composed of a plastic material and each having a lower transversely extending section, an upper transversely extending section, a plurality of vertically extending sections connecting said upper and lower sections, and a plurality of flat supporting bosses formed on each of said upper and lower sections at the ends thereof and at least at one intermediate point;

a plurality of transversely extending support elements composed of a plastic material and each having a plurality of vertically extending sections, a lower transversely extending section connected between each adjacent pair of vertically extending sections, said lower sections being of substantially an open V configuration, a plurality of first longitudinally extending supporting bosses formed on each of said vertically extending sections at the upper and lower ends thereof, and a plurality of additional longitudinally extending supporting bosses formed on said lower sections being of slightly greater longitudinal extension than said first bosses; and

a plurality of metal clamping rods passing through said flat and said first longitudinally extending supporting bosses on said separator and support elements, respectively, for clamping said separator and support elements against one another, said separator and support elements being arranged longitudinally in an alternating fashion so as to define storage cavities between each adjacent pair of separator elements;

said heavy machine parts being able to be respectively disposed within said storage cavities and separated from each other by said separator elements while being supported upon said support elements in such a manner that peripheral portions of said machine parts are able to be supported upon said support elements while front and rear surface portions of said parts are able to be supported by said separator elements.

3,941,274

BOX OR CASE

Francis Edward Tattam, Neild House, Beamond End near Amersham, Buckinghamshire, England

Filed June 6, 1974, Ser. No. 477,095

Claims priority, application United Kingdom, June 15, 1973, 28552/73; Sept. 20, 1973, 44085/73

Int. Cl.² B65D 25/00

U.S. Cl. 220—62 5 Claims

1. A collapsible assembly of panel members capable of being readily assembled into a transport box for the storage and transport of relatively heavy cargo therein and capable of being disassembled into a flat for the efficient storage thereof comprising

a blank member including at least three rigid side panels engageably spaced with respect to one another and a flexible supporting cover to which said rigid side panels are fixedly secured in said spaced relationship, said side panels being disengaged when said blank member is substantially flat, said side panel members having complementary projections and recesses adjacent one another and said projections and recesses having a depth dimension equal to the thickness of said panel members, said projections and recesses of each panel member lockingly engaging one another in mutually supportive perpendicular directions when said blank member is folded into a box, and

a pair of end panels having a plurality of projections engageable with complementary recesses in the ends of said side panel members, said projections of the end panels having a depth dimension at least equal to the thickness of said side panels.

3,941,275

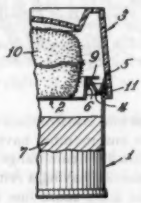
SEALED CLOSURE SYSTEM FOR CONTAINERS

Richard J. Simmons, Carol Stream, Ill., assignor to Plastofilm Industries, Inc., Wheaton, Ill.

Filed Jan. 20, 1975, Ser. No. 542,504

Int. Cl.² B65D 51/18

U.S. Cl. 220—256 12 Claims



1. In a sealed closure system for containers which comprise a large-mouth material container can, a flanged inner lid sealingly closing the can, and an outer cover removably latched by means of detent beads onto the top of the can enclosing the inner lid, the improvement wherein the inner lid is made of thin plastic and the outer cover is provided with stop means engaging the flange of said lid to hold the same

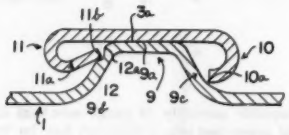
securely in fully closed and sealing position upon the can, the mouth of the can being defined by a circular flange affixed to the can and the flange of the lid extending outwardly beyond said circular flange whereby the outer periphery of the lid flange is free for some downward movement, said stop means engaging only the outer periphery of said lid flange.

3,941,276

PULL TAB ANTI-ROTATION MOUNTING

Anilkumar U. Patel, Summit, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed Nov. 20, 1974, Ser. No. 525,427
Int. Cl.² B65D *41/32*
U.S. Cl. 220—270 10 Claims



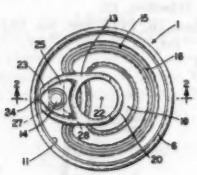
1. A tab ring anti-rotation structure for use on a self-opening end closure, said end closure comprising an end panel having an opening flap therein and a pull tab rotatably attached to said end panel, said anti-rotation structure comprising a plurality of protrusions, each of said protrusions comprising a sidewall and a top formed in said end panel and disposed in symmetric relation to a chord of said end panel drawn along the axis of said flap, said protrusions co-operating with said tab parallel to the plane of said end panel, said sidewalls being substantially linear and inclined at a non-locking angle relative to said tab whereby movement of said tab perpendicular to said end panel to open said closure is unrestricted.

3,941,277

EMBOSSED CAN END CONSTRUCTION

Lynn B. McKinney, Canton, and Gary R. Ortiz, Massillon, both of Ohio, assignors to Van Dorn Company, Cleveland, Ohio

Filed Apr. 21, 1975, Ser. No. 570,245
Int. Cl.² B65D *41/32*
U.S. Cl. 220—273 15 Claims



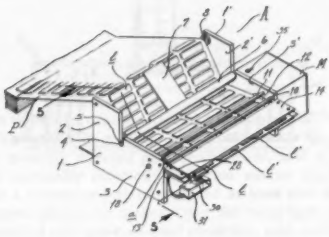
1. Easy opening can end construction for a full opening can including a metal can end member having a seam flange and a recessed corner below the seam flange; an end member wall extending from said corner having a removable panel portion defined by an endless main score line located adjacent said corner; removal of said panel portion from said wall providing a full opening for a can to which the end member is seamed by said seam flange; a ring pull tab having a ring end and an offset nose tip at its other end; rivet means connecting the pull tab intermediate its ends to the panel portion; the nose tip normally being located adjacent the main score line for initiating shear score line rupture upon pulling the ring end of the pull tab away from said wall; an endless heart-shaped groove formation embossed downward in said panel portion symmetrical about a line passing through the center of the end member, the center of the rivet means, and the nose tip; and means controlling initial and final bending of adjacent flap areas of the removable panel portion into the can along spaced bend zones extending perpendicular to said line; said spaced bend zones being located, respectively, outside and inside the rivet means relative to the can end center, and said spaced bend zones both being located outside said embossed groove formation.

3,941,278

LABEL DISPENSING MACHINE

Allen H. Oglander, 9 Sackston Woods, St. Louis, Mo. 63141, and Richard E. Shannon, 355 Albert, St. Louis, Mo. 63033

Filed July 10, 1974, Ser. No. 487,038
Int. Cl.² B65H *5/28*
U.S. Cl. 221—73 1 Claim



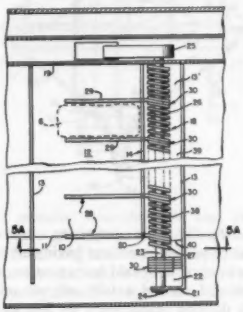
1. A label dispensing machine for use with a sheet-like backing having discrete label-forming members removably adhesively secured to at least one face thereof comprising a frame having spaced apart side plate, having aligned forward end edges, a support plate extending transversely between the forward portions of said side plates in planar perpendicular relationship thereto, said support plate projecting forwardly beyond the forward end edges of said side plates, the forward end edge of said support plate defining a parting edge, a top plate provided spacedly above the forward end portion of said support plate in spaced apart relationship to define therewith an intervening discharge passage for said backing, a prime mover mounted on said frame, a guide rod extending between said side plates in their upper, rearward portions, a roller extending between said side plates in their central portion, downwardly of said guide rod and rearwardly of said support plate, a hold down plate mounted on said roller being of such length as to extend upwardly beyond said guide rod to maintain the backing thereover in taut condition, a shaft extending between said side plates beneath the rearward portion of said support plate and being engaged to said prime mover for rotation upon energization of the latter, a driven roller extending between said side plates beneath said support plate and peripherally engageable with said shaft, means for swinging said driven roller away from said shaft for facilitating backing feeding therebetween, an arm fixed to the forward end of one of said side plates and projecting forwardly therefrom in elevated relationship to the underlying portion of said support plate, said arm extending beyond said support plate, a switch housing adjustably mounted upon said arm in its extended portion for selected disposition therealong toward and away from said support plate, a normally closed control switch carried in said switch housing, said switch having an actuating arm for disposition within the path of travel of a label-forming member upon movement of the backing member downwardly and rearwardly about said parting edge, circuit means connecting said prime mover and said switch whereby said sheet-like backing member is directed over said guide rod downwardly beneath said roller and thence through said discharge passage, thence downwardly and rearwardly about the parting

edge of the support plate for engagement between said shaft and said driven roller with said prime mover being controlled by the engagement of a parted label with the said switch actuating arm for opening of the switch to stop the prime mover for withdrawal of the parted label-forming members.

3,941,279
ARTICLE VENDING APPARATUS

Merrill Krakauer, One Deer Path, Short Hills, N.J. 07078

Filed Apr. 30, 1974, Ser. No. 465,679
Int. Cl.² B65G *33/04*
U.S. Cl. 221—86 **11 Claims**



1. An article vending apparatus including, a shelf adapted to provide the full support for a plurality of adjacent aligned articles disposed thereon, said shelf having a forward edge defining a discharge point, a feeder assembly disposed adjacent said shelf and having a longitudinal axis parallel to the alignment of said articles, said feeder assembly including an axial element having a helical periphery providing a plurality of helical convolutions, a divider member associated with and disposed behind each article upon said shelf and having a main body overlying said shelf, said divider members each including a drive head adjacent said main body laterally of said articles supported on said shelf and selectively engageable with said feeder assembly between any pair of said helical convolutions thereof to maintain said divider members in a fixed selected distance from one another, and driving means engaging said feeder assembly to rotate same while concurrently rotating said helical convolutions with each said divider member drive head engaged thereby advancing to displace said divider member main body toward said shelf forward edge until its associated article is pushed along said shelf and the forwardmost said article is pushed past said forward edge.

3,941,280
APPARATUS FOR CONTROLLING DEVELOPER EFFICIENCY

Robert W. Gundlach, Victor, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 13, 1974, Ser. No. 442,292
Int. Cl.² B67D *5/08*
U.S. Cl. 222—52 **4 Claims**

1. Apparatus for controlling developer efficiency in an electrostatic copying machine comprising:

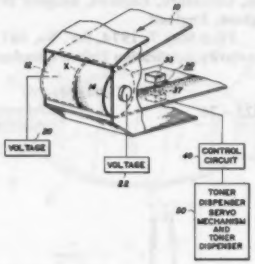
a thin film of semi-insulating translucent material positioned for advancement through a development zone indicative of the quality of a developer system,

a plurality of conductive members each member being positioned in the path of the film on one side thereof in contact therewith in the vicinity of the development zone,

said conductive members each being coupled to a different source of potential having a difference of from about 200 volts to about 600 volts to cause development of the film only at the vicinity where potential difference is greatest,

said conductive members being spaced apart by a distance from about 5 to about 50 mils,

detection means for sensing the optical transmission of the film where development occurs where potential difference is greatest and supplying electrical signals for controlling toner dispensing in the developer system, and



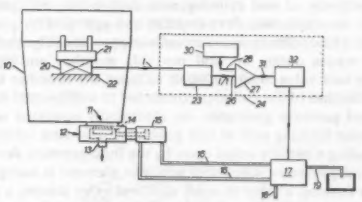
toner dispensing means for dispensing toner at a predetermined rate in response to control signals,

control means responsive to electrical signals from said detection means to generate signals to actuate said toner dispensing means.

3,941,281
CONTROL DEVICE FOR REGULATING TEEMING RATE

Robert Duncan Hind, Sheffield, England, assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Oct. 21, 1974, Ser. No. 516,533
Claims priority, application United Kingdom, Oct. 31, 1973, 50541/73
Int. Cl.² B22D *37/00, 41/10*
U.S. Cl. 222—56 **10 Claims**



1. Apparatus for admitting molten metal into a receiver vessel, said apparatus comprising:

a charging vessel which has a discharge orifice and includes a sliding gate valve for controlling flow of molten metal through said orifice to said receiver vessel;

means for actuating said valve to achieve a controlled flow rate therethrough and being reliant solely on a monitoring of the overall weight of one of said vessels, said means including:

a load sensor on said one of said vessels, the weight of which is monitored;

a differentiating circuit connected with said sensor for differentiating a load sensor output signal with respect to time;

a presettable reference signal generator;

a difference amplifier having inputs connected both to said differentiating circuit and to said reference signal generator to receive output signals from each;

said difference amplifier being operative to derive an error output signal from the input signals thereto from said differentiating circuit and said reference signal generator; and

a valve actuator connected to said difference amplifier to which said valve actuator said error output signal is fed for controlling the setting of said valve.

3,941,282

HYDRAULIC SYSTEM

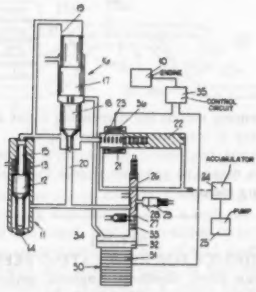
Ivor Fenne, Greenford, England, assignor to C.A.V. Limited, Birmingham, England

Filed May 7, 1974, Ser. No. 467,822

Claims priority, application United Kingdom, May 12, 1973, 22719/73

Int. Cl.[2] F04B *41/06*

U.S. Cl. 222—76 3 Claims



1. An hydraulic system comprising a cylinder, a movable member located in said cylinder, a source of liquid under pressure, first and second conduit means connecting the ends respectively of said cylinder with said source of liquid, first valve means in said first conduit and operable to place the ends of said cylinder in communication with each other, resilient means acting on said movable member and operable when said valve means is open to move the member towards the one end of the cylinder connected to said second conduit, a fluid pressure generator, an electrically operated actuator element forming part of said generator, said first valve means including a surface acted upon by the fluid pressure developed by said generator when said actuator element is energised so as to develop a force to open said first valve means, a control circuit for said actuator, means responsive to the position of said movable member for providing a signal to said control circuit when said first valve means is in the closed position whereby when said member attains a predetermined position, said actuator element will be de-energized to allow said first valve to move to the open position, an outlet passage communicating with the other end of the cylinder, a control valve for controlling liquid flow through said outlet passage, said control valve including a control valve member subject to the pressure of liquid in said other end of the cylinder, said pressure acting on said valve member to open said control valve, said control valve further including means acting on said control valve member for applying to said control valve member a force greater than the force developed on the control valve member by the pressure in said other end of the cylinder, said means defining a further surface which can be subjected to the fluid pressure developed by said fluid pressure generator, whereby when fluid pressure is developed by said generator the force acting on said control valve member is reduced to the extent that the control valve member moves to allow fluid flow through said outlet passage, the volume of fluid flow depending upon the movement of said movable member.

3,941,283

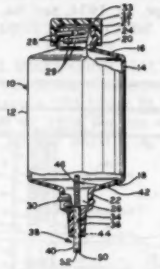
TIMED DROP APPLICATOR

Siegfried Garbe, Canton, Ohio, assignor to The Nilodor Company, Inc., North Canton, Ohio

Division of Ser. No. 226,686, Feb. 16, 1972, Pat. No. 3,804,592. This application Dec. 14, 1973, Ser. No. 424,807

Int. Cl.[2] B67D *3/00*

U.S. Cl. 222—187 5 Claims



1. A liquid drop dispenser comprising a non-metallic receptacle for liquid to be dispensed and having a body portion and opposite ends integral with said body portion, said receptacle including first and second axially aligned openings in said opposite ends defined respectively by first and second neck means integral with and extending axially outwardly from the corresponding end, drop dispensing means including constricted wick means associated with said first opening for dispensing liquid in droplet form from said receptacle at predetermined fixed time intervals, said drop dispensing means being operable to dispense drops at said fixed time intervals whenever the interior of said receptacle is vented to atmosphere, said wick means being radially constricted along a length thereof to alone provide said predetermined fixed time interval between drops dispensed when said interior is vented to atmosphere, a closure cap on said second neck means, said closure cap and second neck means being cooperably threaded for said second neck means to support said closure cap for displacement relative thereto, said closure cap being selectively displaceable between said first and second positions on said second neck means, said closure cap in said first position sealingly engaging said second neck means to seal the interior of said receptacle relative to atmosphere to prevent dispensing, said closure cap and second neck means in said second closure cap position venting said interior to atmosphere to achieve dispensing at said fixed time intervals, and said closure cap being removable from said second neck means to facilitate introducing liquid into said receptacle through said second opening.

3,941,284

APPARATUS FOR DISCHARGING MATERIALS FROM HOPPERS

Reuben Fraser McLean, 3 Westbourne Crescent, Bearsden, Glasgow, Scotland

Continuation-in-part of Ser. No. 243,099, April 11, 1972, abandoned, which is a continuation of Ser. No. 34,349, May 4, 1970, abandoned. This application May 13, 1974, Ser. No. 469,706

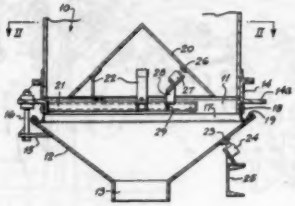
Claims priority, application United Kingdom, May 23, 1969, 26344/69

Int. Cl.[2] B65G *65/70*

U.S. Cl. 222—202 11 Claims

1. Apparatus for promoting material flow from a storage bin or hopper comprising a material supporting member having material contacting walls capable of flexural vibration and having a discharge opening therein, means for mounting said member beneath the outlet of a bin or hopper comprising

means for securing said member to said bin or hopper at least at some of an even number of positions around said member, which positions are nodal positions when the member is excited at or near resonant frequency and there being antinodal regions between said positions, baffle means disposed in spaced relationship above the discharge opening to prevent



direct flow of material therethrough, and vibrator means acting on the walls of said member in at least one of said antinodal regions exciting said material supporting member at or in the region of a resonant frequency thereof so as to promote predominantly flexural vibration of said material supporting member.

3,941,285

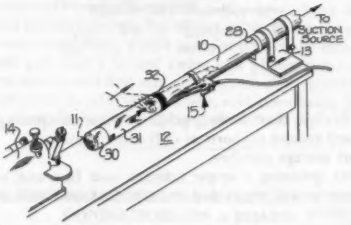
APPARATUS FOR PRODUCING PANTY HOSE

Bill E. Bailey, Henderson, N.C., assignor to Americal Corporation, Henderson, N.C.

Division of Ser. No. 502,163, Aug. 30, 1974, Pat. No. 3,900,899. This application Apr. 28, 1975, Ser. No. 572,425

Int. Cl.² A41H *43/00*

U.S. Cl. 223—43 5 Claims



1. An apparatus for everting, inspecting and slitting tubular panty hose blanks, said apparatus comprising

a. an elongate tubular form having an open free end,

b. means associated with the other end of said tubular form for drawing air inwardly through the open free end and along the length of said tubular form to create suction currents therein, and

c. a heated wire slitter supported on one side of said tubular form and a predetermined distance from the open free end thereof, said heated wire slitter including a portion extending transversely and outwardly from said one side of said tubular form to engage and slit a tubular panty hose blank as the blank is drawn onto said tubular form and beyond said heated wire slitter.

3,941,286

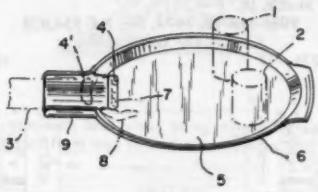
ONE-HANDED SERVING TRAY

John W. Perkinson, 2104 Forresthill Road, Alexandria, Va. 22307

Continuation-in-part of Ser. No. 513,067, Oct. 8, 1974, abandoned. This application June 4, 1975, Ser. No. 583,561

Int. Cl.² A47G *23/06*

U.S. Cl. 224—48 C 16 Claims



1. A serving tray, comprising:

a. a generally planar tray having a top and bottom surface and a periphery;

b. said tray having an opening extending through said top and bottom surfaces, said opening dimensioned so that at least a portion of a hand may be inserted through said opening so that fingers and at least a portion of a palm of the hand may serve to support said tray when the hand is positioned generally parallel to said tray; and

c. support means connected with and generally parallel to said tray, extending beyond said periphery at least to as far as a wrist and below the bottom surface of said tray, and shaped so as to generally conform to the shape of the underside of the wrist.

3,941,287

FILM PULL-DOWN MECHANISM

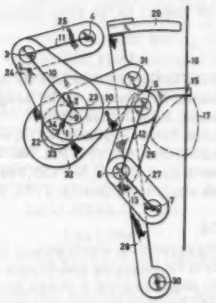
Paul Lohse, Kissing, Germany, assignor to Firma Arnold & Richter KG, Munich, Germany

Filed May 16, 1974, Ser. No. 470,668

Claims priority, application Germany, May 18, 1973, 2325420

Int. Cl.² G03B *1/22*

U.S. Cl. 226—57 11 Claims



1. A film moving mechanism having seven swivel joints, three of which joints are stationery and four of which joints are comprised in a four joint linkage which is adapted to generate a compound curve, and a rotating drive means, said mechanism comprising:

two link members, one link member being attached to the four joint linkage and said two link members being mounted between a first plane containing the film and a

second plane parallel to said first plane and intersecting the drive means; and

a film pull-down claw connected to said one link member for engaging performations in the film and moving that film.

3,941,288

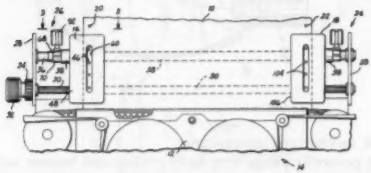
APPARATUS FOR POSITIONING A WEB

Robert R. Wanat, Park Ridge, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Dec. 18, 1974, Ser. No. 534,025

Int. Cl.² G03B *1/30*

U.S. Cl. 226—74 **10 Claims**



1. An apparatus for positioning a web with respect to the print mechanism of a printer, the web defining two parallel continuous marginal edges comprising:

a main support frame carrying an elongated support member in the form of a rod mounted upon the support frame, the axis of the rod being substantially parallel to the plane of the web;

slide means in the form of a tube coaxially positioned over said rod for selective movement therealong;

first means for engaging the web at a fixed location adjacent one of the margins thereof, said first web engaging means being carried upon said slide means for selective movement therealong;

second means for engaging the web at a second fixed location adjacent an alternate margin of the web, said second web engaging means being mounted in a fixed position upon said tube; and

first means for releasably securing said first web engaging means to said tube so as to facilitate relative spacing between said first and second web engaging means whereby relative movement of said first and second web engaging means provides selective adaptation of the apparatus to varying web widths and movement of said tube with respect to said rod provides selective orientation of the web with respect to the print station.

3,941,289

LABEL PRINTING AND APPLYING APPARATUS

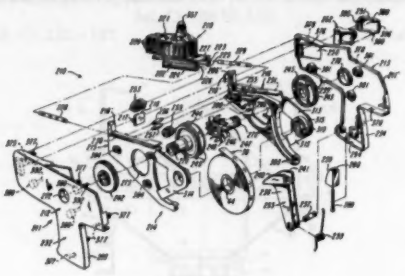
William A. Jenkins, Englewood, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 366,919, June 4, 1973, which is a division of Ser. No. 206,061, Dec. 8, 1971, Pat. No. 3,783,083, which is a continuation-in-part of Ser. No. 155,740, June 23, 1971, abandoned. This application June 3, 1974, Ser. No. 475,730

Int. Cl.² B65H *17/22*

U.S. Cl. 226—76 **16 Claims**

1. Web feeding apparatus, comprising: a feed wheel having a plurality of teeth for engaging and driving a web, a position varying mechanism comprising a driven member secured to the feed wheel and having a plurality of spaced apart teeth and a driving member having a plurality of pawls engageable with less than the total number of teeth, the pawls being urged against the teeth to normally prevent rotation of the driving member relative to the driven member in either the driving direction or the non-driving direction, means for manually rotating the driving member in the non-driving direction relative to the driven member, means for driving the driving member, the driving means comprising a pivotally-mounted manually operable operating lever pivotal in opposite directions, a drive gear carried by the operating lever, a driven gear driven by the drive gear, a drive pawl carried by the driven gear, and a ratchet wheel driven by the pawl upon rotation of the driven gear and the pawl in one direction, and means for drivingly



coupling the ratchet wheel and the driving member of the position varying mechanism, the position varying mechanism being effective to vary the position of the ratchet wheel relative to the feed wheel.

3,941,290

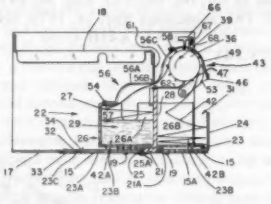
FLEXIBLE CHART FEEDING GUIDE OR CHUTE

John G. Bunning, Indianapolis, Ind., assignor to Esterline Corporation, New York, N.Y.

Filed Aug. 26, 1974, Ser. No. 500,753

Int. Cl.² B65H *23/04*

U.S. Cl. 226—83 **17 Claims**



1. A flexible chart feeding guide or chute comprising:

first and second supports at different elevations;

a chart storage member;

a sheet spanning a space between said first and second supports and supported by said first and said second supports;

said first support being connected to said sheet in at least two horizontally spaced points;

said second support being connected to said sheet in at least two horizontally spaced points;

said first support being above said second support;

said sheet being flexible about a line between the two spaced points of the upper support;

said first and second supports being horizontally movable with respect to each other in a direction perpendicular to the direction of said line between the two points of said first support,

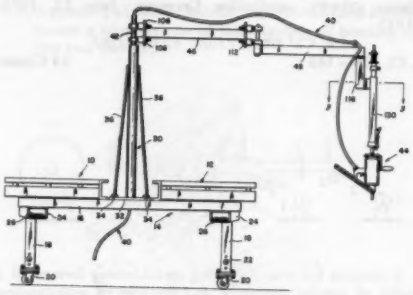
one of said supports being connected to said storage member and movable therewith with respect to the other of said supports when said storage member is moved from a chart loading position with respect to said supports to a chart use position, and back from said use position to said loading position.

3,941,291

PALLET JIG AND TABLE

Leil W. Hayworth, 846 Hill St., Spearfish, S. Dak. 57783

Filed Aug. 9, 1974, Ser. No. 496,261
Int. Cl.² B25C 7/00
U.S. Cl. 227—152 8 Claims



1. A jig assembly for manufacturing pallets comprising:

a. a pair of jigs mounted on a supporting table, each jig being formed with longitudinal and transverse frame members for supporting beam components of a pallet to be formed prior to nailing of further pallet components thereto, resiliently mounted keeper arms pivotally mounted on said frame members for biasing said beam components against said transverse frame members for accurately aligning said beam components in said jig,

b. means for supporting said jig at a convenient working height,

c. a post mounted between said jigs and extending upwardly therefrom,

d. a nailer means for nailing top and bottom rows of said further pallet components to said beams, and

e. means for pivotally mounting said nailer means for pivotable, swinging movement about said post whereby said nailer means can be moved to any area above either of said jigs for effecting the nailing operation, said mounting means comprising a first swing arm pivotally mounted to said post and a second swing arm pivotally mounted at one end to said first arm and operatively connected at its other end to said nailer means, said arms being disposed in generally horizontal planes above said jigs.

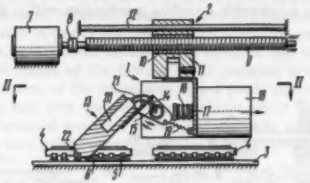
3,941,292

APPARATUS FOR SOLDERING A PLURALITY OF FLAT CONDUCTORS ON A BOARD

Anatoly Alexandrovich Osipov, proezd Kadomtseva, 7, kv. 26; Nikolai Semenovich Pekov, ulitsa B. Mariinskaya, 2, kv. 77, and Petr Pavlovich Semenov, Leninsky prospekt, 91, kv. 69, all of Moscow, U.S.S.R.

Filed June 6, 1974, Ser. No. 477,062
Int. Cl.² B23K 1/12, 3/02, 37/06
U.S. Cl. 228—35 3 Claims

1. Apparatus for soldering on a board a plurality of flat conductors and leads of integrated microcircuits in particular, comprising: a head, a soldering element connected to said head, means for displacing said head relative to said board, said soldering element having a working surface including a portion unwetted by the solder and an elongated portion wetted by the solder, said elongated portion wetted by said solder being bordered on two sides by said unwetted portion, means for heating said soldering element and spaced from said portions, said elongated portion having a longitudinal axis disposed at an angle to the direction of relative displacement of said head and said board, said elongated portion spreading



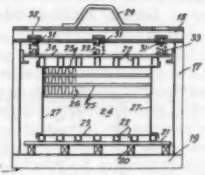
solder over each lead while being moved by said head at constant rate from lead to lead in succession.

3,941,293

BRAZING JIG FOR ALUMINUM RADIATOR CORES

Andre Chartet, Meudon, France, assignor to Societe Anonyme des Usines Chausson, Asnieres, France

Division of Ser. No. 372,945, June 25, 1973, Pat. No. 3,880,578, which is a division of Ser. No. 69,593, Sept. 4, 1970, Pat. No. 3,769,675. This application Feb. 28, 1974, Ser. No. 447,022
Claims priority, application France, Sept. 22, 1969, 69.32199
Int. Cl.² B23K 37/04; B21D 53/02
U.S. Cl. 228—44.1 R 9 Claims



1. A brazing jig for supporting a radiator to be brazed by progressive travel through a gas furnace in which streams of hot gas are blown transversely to the direction of travel through the furnace by said jig, comprising a rigid, generally rectangular frame, means for connecting said frame to a conveyor, a longitudinally extending base plate at the lower portion of said frame, said base plate having thin projections adapted to make substantially point contact with a radiator to support said radiator, and a top plate having thin projections similarly adapted to bear on said radiator, one of said plates being guided by said frame to be movable and resiliently urged towards said radiator, the front and rear faces of the radiator thereby being exposed when in said furnace to said blown hot gas blowing therethrough in the same manner as a coolant flows when the radiator is in actual use.

3,941,294

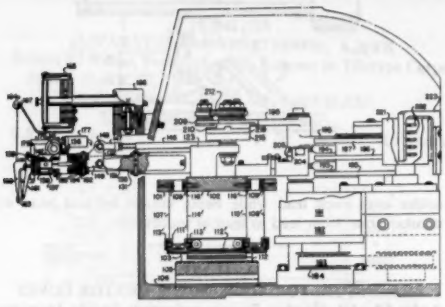
WIRE BONDING APPARATUS WITH IMPROVED Z-AXIS MOTION CONTROL

Karl-Heinz Johannsmeier, Los Altos, Calif., assignor to Automated Equipment Corporation, Mountain View, Calif.

Filed Mar. 5, 1974, Ser. No. 448,251
Int. Cl.² B23K 19/00, 37/02
U.S. Cl. 228—4.5 20 Claims

1. Apparatus comprising a base structure; holder means mounted on the base structure for supporting a workpiece; an X-Y stage mounted on the base structure for movement along coordinate X and Y axes; first control means coupled to the X-Y stage for controlling movement thereof along the coordinate X and Y axes; a support arm fixedly mounted on the X-Y

stage; a tool mounted on the support arm for movement along a coordinate Z axis towards and away from the workpiece supported on the holder means; and second control means, including a rotatable coupling mechanism with a plurality of

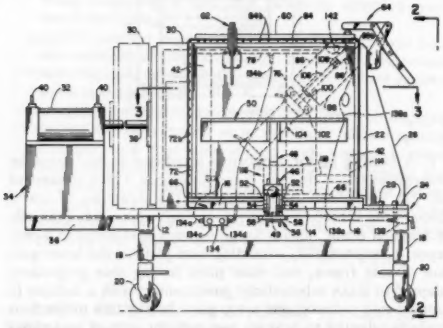


positively coupled rotatable members one of which is pivotally coupled to the tool, for positively controlling movement of the tool along the coordinate Z axis independently of movement of the X-Y stage along the coordinate X and Y axes.

3,941,295
WELDING JIG

Irving Medgebow, and Gene White, both of Tampa, Fla., assignors to Jackson Products Company, Tampa, Fla.

Filed Nov. 8, 1974, Ser. No. 522,041
Int. Cl.² B23K *37/04*
U.S. Cl. 228—44.1 R **15 Claims**

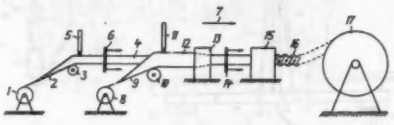


1. A jig for welding sheet metal workpieces to define a box-like structure having opposed pairs of wall panels and an end panel and lines of juncture therebetween comprising, base means, frame means on said base means and including frame members extending in the direction of said lines of juncture, wall means cooperable with said frame means to receive and releaseably support said work pieces therebetween, said frame members having gas passageway means therein connectable to a source of inert gas and including outlet means for delivering inert gas in the direction of said lines of juncture, said wall means including a fixed wall on said base means having an edge corresponding to one of said lines of juncture and said frame members including a first frame member generally parallel to said edge and movable relative to said fixed wall, means supporting said first frame member on said base means for reciprocating movement between first and second positions along a path toward and away from said wall edge, and means to selectively reciprocate said first frame member between said positions, said first frame member being adjacent said fixed wall when said first frame member is in said first position.

3,941,296
PROCESS FOR MANUFACTURING FLEXIBLE TUBING CAPABLE OF WITHSTANDING SUBSTANTIAL PRESSURES AND FLEXIBLE METAL TUBING MADE THEREBY

Gerhard Ziemek, Langenhagen, Germany, assignor to Kabel- und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Germany

Filed June 3, 1974, Ser. No. 475,642
Claims priority, application Germany, June 22, 1973, 2331757
Int. Cl.² H01B *13/00;* **B23K** *31/02*
U.S. Cl. 228—148 **14 Claims**



1. A process for manufacturing metal tubing formed of a plurality of tubular members and capable of withstanding substantial pressures, comprising the steps of:

deforming a first metal band in a longitudinal direction into a first tubular member;

continuously welding the longitudinal edges of said first tubular member to form a first tubular member having a longitudinally welded seam;

deforming at least a second metal band in a longitudinal direction concentrically about said first tubular member and into a second tubular member;

continuously welding the longitudinal edges of said second tubular member to form a second tubular member having a longitudinally welded seam;

reducing the diameter of said second tubular member to form metal tubing formed of a plurality of tubular members; and

corrugating said metal tubing formed in a transverse axial direction.

3,941,297
METHOD AND APPARATUS FOR SIMULTANEOUSLY BONDING A PLURALITY OF LEAD FRAMES TO A PLURALITY OF PLANAR ARTICLES

John Andrew Burns, New Hope Borough, Pa., and Andrew Robert Sivo, Jr., Hamilton Township, Mercer County, N.J., assignors to Western Electric Company, Inc., New York, N.Y.

Filed June 2, 1975, Ser. No. 583,213
Int. Cl.² B23K *19/00, 37/04*
U.S. Cl. 228—180 A **14 Claims**

5. Apparatus for concurrently bonding the leads of a plurality of lead frames to respective bonding sites on the first faces of a corresponding plurality of substantially planar articles, each of said articles having a second face opposite said first face, said apparatus comprising:

a. a plurality of independently movable bonding tips, one for each lead frame, positioned in a predetermined array of bonding tips and adapted to engage the leads of the associated lead frames;

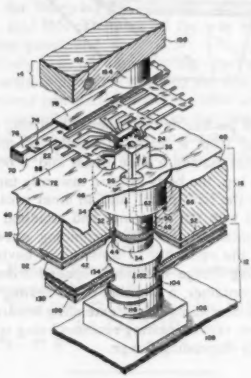
b. a thermode adapted to simultaneously engage the second faces of all of said plurality of articles and to be heated to bonding temperature; and

c. operating means adapted to concurrently and independently move each of the associated bonding tips, lead frames, and planar articles in a first direction to engage the second face of each of the plurality of planar articles with the thermode and apply a substantially uniform bonding pressure through said bonding tips concurrently to all of said lead frames and bonding sites.

12. Apparatus for simultaneously bonding a plurality of lead frames to respective bonding sites on a first face of each of a plurality of substantially planar articles, said articles having a second face opposite said first face, said apparatus comprising:

a. a plurality of independently movable bonding tips, one for each lead frame, positioned in a predetermined array of bonding tips and adapted to engage the leads of the associated lead frames;

b. a plurality of independently movable pistons, adapted to mount a separate one of said plurality of bonding tips in one end thereof;



c. registration means for registering each of the lead frames with the associated bonding tip and the bonding sites on the respective planar article;

d. a thermode adapted to simultaneously engage the second face of said plurality of articles and to be heated to bonding temperature; and

e. operating means adapted to concurrently and independently move all of said plurality of pistons, and in turn, said plurality of registered bonding tips, lead frames and planar articles, in a first direction to engage the second face of each of the plurality of planar articles with said thermode and apply a substantially uniform bonding pressure through said pistons and bonding tips concurrently to all of said plurality of lead frames and bonding sites.

3,941,298

PROCESS OF MAKING WIRE CONNECTIONS IN SEMI-CONDUCTOR ELEMENTS

Karl Nicklaus, Steinhausen, Switzerland, assignor to Esec Sales S.A., Zug, Switzerland

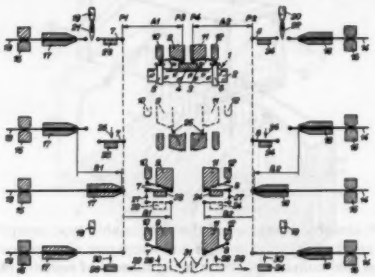
Continuation-in-part of Ser. No. 411,352, Oct. 25, 1973, abandoned. This application June 5, 1975, Ser. No. 584,369

Claims priority, application Switzerland, Oct. 26, 1972, 15635/72

Int. Cl.² H01L *21/603*

U.S. Cl. 228—180 A **26 Claims**

1. In a process for the continuous production of at least one wire connection on a semi-conductor element, said process including preparing a wire piece, fusing a sphere onto both ends of said wire piece, and connecting the wire piece with heated contact locations on the semi-conductor element through thermal compression, the improvement comprising: providing a linear spare wire supported in a tubular guide member and protruding therefrom with its leading end; gripping said protruding end and fusing-off a wire piece from the spare wire whilst concurrently fusing a sphere onto the fused-off ends of the wire piece and the spare wire; displacing the wire piece transversely to the longitudinal axis of the spare wire from its initial position into a first displaced position; displacing both the tubular guide member supporting the spare wire and the wire piece in a direction along said axis for a predetermined distance, whereby upon displacement of the tubular guide member the sphere formed on the end of the spare wire contacts the tubular guide member and by continued displacement of the tubular guide member is conveyed through motion of the spare wire into a predetermined position along said axis, and whereby the wire piece occupies a second displaced position; conveying the wire piece transversely to said axis towards a pressing tool, whereby the wire



piece occupies a third displaced position; taking up the wire piece by the pressing tool, returning the tubular guide member in a direction along said axis into its initial position while retaining the spare wire supported therein in a fixed position, whereby the spare wire again protrudes from the tubular guide member with its leading end; pressing both said spheres on the wire piece through actuation of the pressing tool onto said heated contact locations on the semi-conductor element; and concurrent with the pressing-on, gripping said protruding end of the spare wire and fusing-off a subsequent wire piece from the spare wire.

3,941,299

METHOD OF BRAZING CU ALLOYS TO AG-CDO ALLOYS

Loren Godfrey, Morristown, N.J., assignor to Engelhard Minerals & Chemicals Corporation, Murray Hill, N.J.

Filed Aug. 26, 1974, Ser. No. 500,586

Int. Cl.² B23K *1/04*

U.S. Cl. 228—219 **15 Claims**

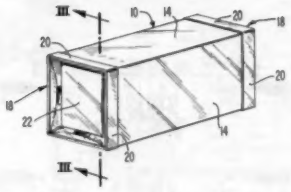
1. A method of joining by brazing a copper alloy carrier object and an alloy contact object, said alloy of said contact object being a silver cadmium oxide alloy having a cadmium oxide content in the range from about 5% to about 15% by weight, which comprises placing said copper alloy carrier object and said alloy contact object into direct contact such that there is defined an exposed position of junction where said carrier object and said contact object come into direct contact, placing at said position or junction a quantity of brazing alloy, said brazing alloy being slected from the brazing alloys having the composition about 56% by weight silver, about 22% by weight copper, about 17% by weight zinc and about 5% by weight tin or about 65% by weight silver, 20% by weight copper and 15% by weight zinc, maintaining said brazing alloy at said position or junction relative to said carrier object and said contact object while subjecting the resulting assembly to furnace brazing at a temperature in the range from about 1200° to about 1600°F. for a period of time in a non-reactive gaseous atmosphere to cause said quantity of brazing alloy to melt and to join and braze together said carrier object and said contact object.

3,941,300

FOLDED PLASTIC CONTAINER WITH SNAP LID

John S. Troth, Wilmington, Del., assignor to Pamark, Inc., Montchanin, Del.

Filed July 19, 1974, Ser. No. 490,049
Int. Cl.² B65D 5/12
U.S. Cl. 229—5.5 18 Claims



1. A closable container of the re-openable type comprising a sleeve-like container portion and a separate closure portion, at least said container portion being formed of resilient plastic material having memory properties, said closure portion being adapted for generally transverse disposition at an end of said container portion, and at least one set of snap type locking means for removably securing said closure portion into closed engagement relative to said container portion under a greater opening force than closing force, said locking means comprising:

a. tab means of said container member, with a base portion of said tab means being carried by a wall portion of said container portion at an end portion of said container portion, with said tab means having an initial disposition with said wall portion when said closure portion is in unassembled disposition relative to said container portion, and terminating in a free tab edge of a width adapted when directed longitudinally inwardly of said container portion to extend to a predetermined depth from the adjacent end of said container portion, and

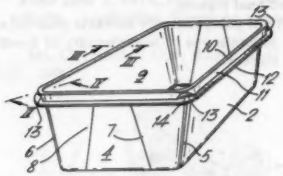
b. protrusion means carried by said closure portion and disposed within said container portion and being directed toward said wall portion of said container portion when said closure portion is in assembled disposition relative to said container portion, said protrusion means defining ledge means located at substantially said predetermined depth from the adjacent end of said container portion when said closure portion is in assembled disposition relative to said container portion, said ledge means facilitating abutting engagement with said free tab edge, said closure means having flange means in overlying relation to an outer surface portion of a container wall portion at said end of said container portion adjacent said closure portion, said initial disposition of said tab means being longitudinally into said container portion at a first acute angle, with the free tab edge being directed an of said container portion to said predetermined depth in the unassembled disposition of the closure portion relative to the container portion, said protrusion means having camming surface means facing toward an opposite end of said container portion, whereby said tab means is resiliently displaceable to a position at a second acute angle with said wall portion after assembly of said closure portion and container portion into closed disposition; said second acute angle being no greater than said first acute angle, said tab means being adapted to be moved toward an lesser angle than said second angle in response to ana opening force applied to separate said closure and container portions.

3,941,301

STACKABLE PACKAGING CONTAINER

Arne Jorgensen, Korsor, Denmark, assignor to Lever Brothers Company, New York, N.Y.

Filed Apr. 22, 1974, Ser. No. 463,020
Int. Cl.² B65D 5/62
U.S. Cl. 229—14 BE 4 Claims



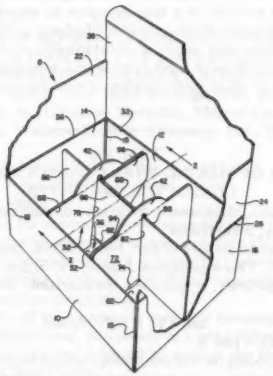
1. A stackable packaging container comprising an external container folded from a blank of cardboard material, the external container having a base panel and a body portion having an open top, the body portion inwardly tapering from the open top to the base panel, and an inner protective liner in close contact with the container and attached at least locally to the container, the liner extending outwardly and downwardly of the open top to form a rim having a downwardly depending flange outwardly spaced from the body portion of the container, a plurality of de-nesting recesses in the downwardly depending flange extending inwardly towards the body portion, said de-nesting recesses being spaced along said downwardly depending flange.

3,941,302

AUTO PARTITION PACK WITH HANDLES

Walter J. Tyrseck, Quaker Hill, Conn., assignor to Robertson Paper Box Co., Inc., Montville, Conn.

Filed June 9, 1975, Ser. No. 585,397
Int. Cl.² B65D 5/48
U.S. Cl. 229—27 10 Claims



1. A partitioned box comprising

A. first and second pairs of parallel wall panels hinged together to form a tube,

B. a first pair of similar bottom panels hinged to the bottom edges of the first pair of wall panels,

C. a second pair of similar bottom panels hinged to the bottom edges of the second pair of wall panels, said two pairs of bottom panels interfitting to completely close the bottom of the box,

D. a first pair of similar partition panels hinged to the edges of the first pair of bottom panels parallel to their hinges with the wall panels,

E. a second pair of partition panels hinged to the edges of the second pair of bottom panels parallel to their hinges with the wall panels,

F. means for hingedly connecting a side edge of one partition panel in the second pair to one partition panel in the first pair,

G. means for hingedly connecting a side edge of the other partition panel in the second pair to the other partition panel in the first pair,

H. a substantially vertical slot in each first pair partition panel for receiving an opposing second pair partition panel, said slot extending all the way to the top of said partition panel, and

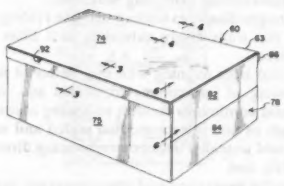
I. a relatively large tab hinged to the upper edge of each first pair partition panel for bridging the slot therein to retain the second pair partition panel within said slot, said tabs being accessible to function as carrying handles for the box and being foldable down against the tops of the partition panels when a cover is placed on the box.

3,941,303

SHIPPING CASE

Charles J. Wilbur, Barrington, Ill., assignor to The Quaker Oats Company, Chicago, Ill.

Filed Feb. 27, 1975, Ser. No. 553,667
Int. Cl.² B65D 5/02
U.S. Cl. 229—37 E **7 Claims**



1. A shipping assembly for facilitating store-cut removal of shipping case tops for price marking of content containers, and for substantially eliminating store-cut damage to containers, said assembly comprising:

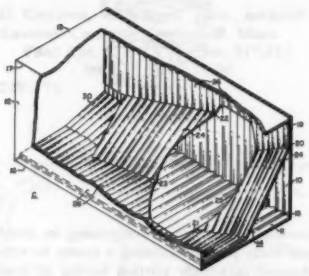
a corrugated board shipping case comprising a top panel and having a plurality of containers packed therein; each of said containers having indicia imprinted thereon establishing a top and a bottom of the respective containers, said containers being arranged within said shipping case with the tops of said containers being adjacent the top panel of said shipping case; flaps dependent from said top panel of the shipping case along at least three edges thereof; an opposing pair of said flaps dependent from opposite edges of said top panel free of attachment to the body of the case along an unattached marginal zone along an edge thereof adjacent the top panel, said pair of flaps being secured to the body of the case below the marginal zone, and an intervening edge of said top panel between said opposing flaps being attached to a side panel of said shipping case through a flat S fold thereof in which an outermost leg of the S fold is unattached to an abutting face of a middle leg of the S fold.

3,941,304

CONTAINER FOR A LAMP BULB OR THE LIKE, AND RESULTING PACKAGE

Thomas Barbieri, Peapack; Edward J. Getz, Irvington, and Alfred W. Wilson, Dover, all of N.J., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 30, 1974, Ser. No. 510,826
Int. Cl.² B65D 5/50
U.S. Cl. 229—39 B **15 Claims**



1. A container for packaging a bulbous-shaped article such as an electric lamp, said container comprising;

four interconnected walls of sheet material that define a collapsible open-ended tubular sleeve which has a longitudinal axis, and

integral means for retaining an inserted article in said sleeve and concurrently maintaining the sleeve in erect tubular configuration comprising a hinged panel of sheet material within the sleeve that is flexible along spaced score lines which divide the panel into a central portion and two end portions all of which extend longitudinally of the sleeve,

one of said end portions being fastened to one of the sleeve walls and the other end portion and said central portion being unattached and movable with respect to the sleeve walls,

a part of the end portion of the panel that is attached to the sleeve wall being separated from the other portions of the panel and constituting a tongue-like segment that extends transversely with respect to the longitudinal axis of the sleeve,

the central portion of said panel having a medial opening therein that is adapted to receive the bulbous part of an article that is inserted into the sleeve,

said panel being arranged and dimensioned to lie substantially flat within the sleeve when said sleeve is in collapsed condition and then be automatically moved into article-retaining position when the sleeve is erected into its tubular form,

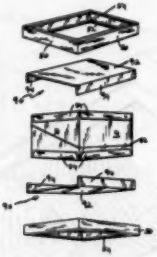
said score lines being so oriented that erection of the sleeve causes (a) the free end of the panel to slide along the wall of the sleeve and engage one corner of the sleeve, (b) the two end portions of the panel to lie flat against adjacent side walls of the sleeve that define another corner of the sleeve, (c) the central portion of the panel to obliquely span and thus be spaced from the corner of the sleeve that is defined by the said adjacent walls thereof, and (d) said tongue-like segment to overlie one of the said adjacent walls of the sleeve and be wedged in frictional engagement with the other of the said adjacent walls of the sleeve.

3,941,305

CONTAINERS WITH RECLOSABLE OPENING MEANS

Douglas Frank Chipp, 3955 Belanger St. E., Apt. 407, Montreal 408, and Raymond Delorme, 4481 Gatineau, Chomedey, Laval, both of Quebec, Canada

Filed June 22, 1973, Ser. No. 372,489
Int. Cl.² B65D 5/32, 5/04
U.S. Cl. 229—44 R 15 Claims



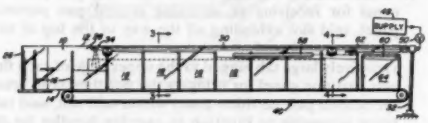
1. A reclosable container comprising in combination a knockdown body portion forming a cavity to retain a commodity therein, said body portion having at least first and second body-forming walls, and said body forming walls each respectively having first and second end margins thereon, said body portion having an aperture communicating with said cavity to permit loading of a commodity therein, closure means including a closure-forming panel operatively hingedly connected to the first end margin on the first of said body-forming walls and capable of being shifted to a closurewise position over said aperture, said closure-forming panel having at least first and second end margins thereon and being substantially parallel to said body-forming walls and being coextensive with at least one of said body-forming walls when the closure means is in an open position and substantially perpendicular to said body-forming walls when the closure means is in the closurewise position, a flap extending from a first of the end margins on said closure-forming panel and capable of being struck in a direction where it lies substantially in perpendicular relation to the exterior surface of said closure-forming panel, a strengthening and retaining frame which has a shape substantially conforming to the shape of said closure means at least partially surrounding said closure-forming panel, said strengthening and retaining frame having a side wall formed of a reinforcing material and first and second flanges extending inwardly substantially perpendicularly from said side wall and being spaced apart from each other by a distance approximately equal to the length of said flap, said side wall of said strengthening and retaining frame being substantially parallel to said first and second body-forming walls when said closure means is in the closurewise position, said first end margin of said closure-forming panel being operatively retained by the first flange on said side wall and the outer end of said flap snugly engaging the second flange on said side wall when said strengthening and retaining frame is assembled with said closure means, said flap being located substantially in parallel relationship to one of said body-forming walls when the closure means is shifted to the closurewise position, said second flange having a bearing surface which faces said first flange and retentively engaging the outer end of said flap, said bearing surface having a width substantially greater than the thickness of said outer end of said flap, said first end margin on said closure-forming panel engaging said side wall and being retained by said side wall and said first flange when said strengthening and retaining frame is assembled with said closure means, whereby said closure means and said strengthening and retaining frame may be opened and closed with respect to the aperture in said body portion through the hinged operative connection of said closure-forming panel to one of said body-forming walls.

3,941,306

SYSTEM OF INTERCONNECTED, SEALED AND UNSEALED BAGS

Roy J. Weikert, Corrington, Ohio

Division of Ser. No. 256,769, June 23, 1972, Pat. No. 3,813,845. This application Jan. 24, 1974, Ser. No. 436,104
Int. Cl.² B65D 33/00, 27/10
U.S. Cl. 229—53 7 Claims



1. A web of bags comprising:

a. a continuous flattened tube of material,

b. said flattened tube having opposed upper and lower longitudinal edges,

c. regularly spaced seal lines extending transversely of said flattened tube,

d. each of said seal lines extending from said lower edge of said flattened tube to a point closely adjacent to but spaced from said upper edge of said tube,

e. said transversely extending seal lines dividing said tube into a series of interconnected bags with said transversely extending seal lines forming sides of said bags, said lower edge of said web forming bottoms of said bags and said upper edge of said web defining a continuous conduit extending across said bags,

f. a longitudinally extending seal line intersecting some of said transversely extending seal lines,

g. said longitudinally extending seal line sealing closed those bags the transversely extending seal lines of which it intersects,

h. said seal lines defining with said flattened tube a system consisting of interconnected, sealed and unsealed bags and said continuous conduit extending across upper ends of each of said interconnected sealed and unsealed bags with said unsealed bags communicating directly with said conduit, and

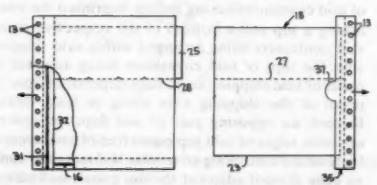
i. means for separating said interconnected bags from each other along the sides thereof.

3,941,307

ENVELOPE ASSEMBLY

Edmund G. Van Malderghem, Lewiston, N.Y., assignor to Moore Business Forms, Inc., Niagara Falls, N.Y.

Filed Aug. 8, 1974, Ser. No. 495,924
Int. Cl.² B65D 27/10
U.S. Cl. 229—69 5 Claims



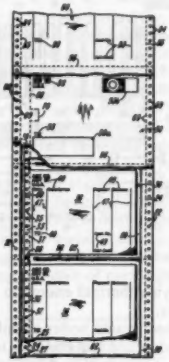
1. An envelope assembly formed of a continuous web having spaced transverse lines of weakening defining a succession of interconnected sealed envelopes, comprising: front and back panels, and insert material within each sealed envelope; said insert material comprising interconnected upper and

lower panels forming a return envelope having an opening along one edge thereof, one of said return envelope panels being separable along a keen line of weakening provided therealong, the other of said return envelope panels having a flap foldable along a fold line provided thereon; attaching means connecting a portion of said insert material in each said sealed envelope with said sealed envelope, said portion comprising a section of said one panel which is superimposed over said flap and which is separable along said keen line of weakening; and a tear strip on each said sealed envelope for opening said sealed envelope and freeing said return envelope from said sealed envelope, said section of said return envelope being retained with said sealed envelope upon the freeing of said return envelope from said sealed envelope.

3,941,308
CONTINUOUS MAILER ENVELOPE ASSEMBLY WITH INSERTS AND METHOD

John S. DiGirolomo, West Carrollton; Marino Giuffre, Dayton; Hugh B. Skees, Dayton, and F. Leo Vath, Brookville, all of Ohio, assignors to The Standard Register Company, Dayton, Ohio

Filed Oct. 31, 1974, Ser. No. 519,575
Int. Cl.² B65D *27/10*
U.S. Cl. 229—69 **34 Claims**



1. A busines form assembly comprising:

a first continuous sheet of paper material, the first continuous sheet having a given width dimension, the first continuous being divided into a series of sections extending along the length thereof, each section having the given width dimension which is equal to the width dimension of the sheet, each section having a given longitudinal dimension,

a second continuous sheet of paper material, the second continuous sheet being positioned upon the first continuous sheet, the second continuous sheet having a series of insert portions, there being an insert portion positioned upon each section, each insert portion having an area less than the area of the section upon which the insert portion is disposed, each insert portion having a width dimension less than said given width dimension and a longitudinal dimension less than said given longitudinal dimension of the section upon which said portion is positioned, the second continuous sheet having a plurality of connecting parts, there being a connecting part joining each insert portion to the insert portion which is positioned upon the section wich is adjacent thereto,

a third continuous sheet of paper material, the third continuous sheet of paper material being positioned upon the second continuous sheet, the third continuous sheet being of said given width and having sections equal in dimension to said sections of the first continuous sheet, each section of the third continuous sheet being positioned above a section of the first continuous sheet, with one of said insert portions therebetween,

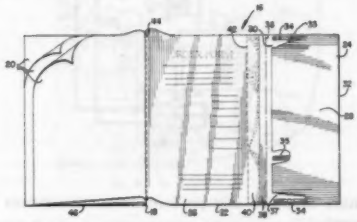
and means attaching the first continuous sheet to the third continuous sheet along the marginal parts of each section to form a series of envelopes, each of which has therewithin one of said insert portions of the second continuous sheet,

the second continuous sheet being free from attachment to either of the other sheets.

3,941,309
COMBINED BROCHURE AND RETURN ENVELOPE PACKAGE

Wilfred H. Gendron, Wilbraham, Mass., assignor to United States Envelope Company, Springfield, Mass.

Filed Apr. 3, 1973, Ser. No. 347,412
Int. Cl.² B65D *27/06*
U.S. Cl. 229—73 **9 Claims**



1. A combined brochure and return envelope package comprising a plurality of rectangular leaves of sheet material of approximately the same size overlying one another to form an assemblage of said leaves and which leaves are joined to one another along one bound edge of said assemblage, said plurality of leaves including a plurality of pages made of a single thickness of said sheet material and also including at least one envelope leaf which envelope leaf throughout at least a portion of its extent comprises two overlying panels of said sheet material joined to one another to form an envelope, said envelope leaf including an elongated sealing flap connected with one of said two overlying panels and forming part of said envelope, said sealing flap having an inner longitudinal edge along which it is connected to said one of said two overlying panels and an outer longitudinal edge parallel to said inner longitudinal edge, said envelope leaf also including a first line of weakening arranged parallel to said one bound edge of said assemblage and located between said envelope and said one bound edge, which first line of weakening is colinear with and defines said outer longitudinal edge of said sealing flap, to enable said envelope to be separated from said envelope leaf by tearing along said line of weakening, said envelope leaf including second portion made of a single thickness of said sheet material and located between said bound edge of said assemblage and said first line of weakening.

3,941,310
THERMOSTATIC CONTROL FOR USE IN VARIABLE AIR DISTRIBUTION SYSTEMS

Dalny Travaglio, Kensington, Calif.; Konstantins Dravnieks, Madison, and Gordon C. Sylvester, Verona, both of Wis., assignors to Wehr Corporation, Milwaukee, Wis.

Filed Jan. 28, 1974, Ser. No. 437,136
Int. Cl.² F24F *1/00*
U.S. Cl. 236—49 **16 Claims**

1. In an air delivery system including duct means for delivering air to an area being serviced, means for supplying air to said duct means, damper means in said duct means and mounted to assume any one of a number of available positions

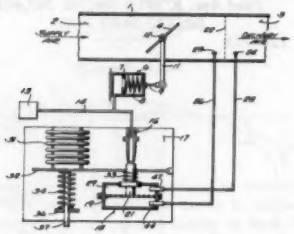
in said duct means for controlling the volume of air flowing therethrough, actuator means connected to and operative to move said damper means selectively to one of said positions; the improvement of temperature and pressure responsive control means positioned in the area being serviced and comprising, in combination,

pressure responsive means connected to and controlling the operation of said actuator means,

means connecting said pressure responsive means for exposure thereof to the interior of said duct means so that said pressure responsive means controls said actuator means in accordance with the pressure condition in said duct means,

said pressure responsive means including biasing means producing a bias force reacting against the pressure condition to which said pressure responsive means is exposed,

and temperature responsive means engaging said biasing means and influencing the magnitude of said bias force and operative to establish bias forces in accordance with the temperature ambient said temperature responsive means so that the position of said damper means in said duct means is determined by the reaction between said biasing means and the pressure condition in said duct means and said pressure responsive means controls said actuator means and in turn said damper means to maintain the volume of flow through said duct substantially constant.



6. In an air delivery system including duct means for delivering air to an area being serviced, means for supplying air to said duct means, damper means in said duct means and mounted to assume any one of a number of available positions in said duct means for controlling the volume of air flowing therethrough, actuator means connected to and operative to move said damper means selectively to one of said positions; the improvement of temperature and pressure responsive control means positioned in the area being serviced and comprising, in combination,

a base,

pressure responsive means connected to and controlling the operation of said actuator means, said pressure responsive means including means defining two chambers in said base and a diaphragm separating said chambers,

means in said duct means for sensing duct pressure and connected to said chambers to produce a pressure differential across said diaphragm so that said pressure responsive means is exposed to the interior of said duct means and said pressure responsive means controls said actuator means in accordance with the pressure condition in said duct means,

said pressure responsive means also including biasing means connected to said diaphragm and producing a bias force reacting against the pressure condition to which said pressure responsive means is exposed,

temperature responsive means comprising a charged bellows,

means connecting said bellows to said base,

and lever means connecting said bellows to said biasing means so that the bias force generated by said biasing means is varied in accordance with the expansion and contraction of said bellows and in accordance with the temperature ambient said bellows

whereby said temperature responsive means is connected to said biasing means and influences the magnitude of said bias force and is operative to establish bias forces in accordance with the temperature ambient said temperature responsive means so that the position of said damper means in said duct means is determined by the reaction between said biasing means and the pressure condition in said duct means and said pressure responsive means controls said actuator means and in turn said damper means to maintain the volume of flow through said duct substantially constant.

3,941,311

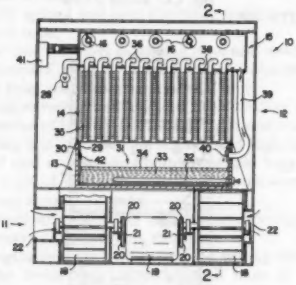
HEATING UNIT

Charles D. McNeely, Uniontown, Ohio, assignor to Nepro, Inc., Uniontown, Ohio

Filed Jan. 27, 1975, Ser. No. 544,276

Int. Cl.² F24H *3/08*

U.S. Cl. 237—16 **22 Claims**



1. A heating unit comprising:

a boiler chamber;

means for supplying thermal energy to the interior of said boiler chamber;

a radiator attached to said boiler chamber;

a header attached to said radiator so as to define at least one passageway communicating from said boiler chamber through said radiator, to said header;

a return line connected to said header and said boiler chamber to define a passageway communicating therebetween to enable circulation within the heating unit;

said boiler chamber containing a two-phase liquid system to affect heat transfer;

the lower phase liquid of said two-phase liquid system being vaporized by said means for supplying thermal energy during operation of the heating unit; and,

the upper phase liquid of said two-phase liquid system being relatively non-miscible with said lower phase and remaining in the liquid state during operation of the heating unit so that said lower phase will percolate therethrough.

3,941,312

INK JET NOZZLE FOR USE IN A RECORDING UNIT

Genji Ohno, Yokohama; Tadamitsu Uchiyama, Tokyo; Seisaku Ohki, Tokyo, and Hishao Morohashi, Tokyo, all of Japan, assignors to Research and Development Laboratories of Ohno Company Limited, Japan

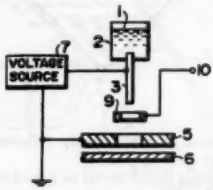
Division of Ser. No. 418,283, Nov. 23, 1973. This application Feb. 28, 1975, Ser. No. 554,020

Int. Cl.² B05B *5/00*; F23D *11/28*

U.S. Cl. 239—15 **15 Claims**

1. A hollow nozzle for use in a recording unit wherein said hollow nozzle has an open end defining a tip for directing a jet of liquid imaging material from said nozzle and said recording

unit comprises means for supplying a liquid imaging material to said nozzle; an electrode plate having a through hole and disposed opposite to said nozzle with said through hole being coaxial with said nozzle; means for disposing a recording member adjacent said electrode plate on the opposite side from said nozzle; a ring having an inner diameter greater than the outer diameter of said nozzle disposed in close proximity to said nozzle tip and in coaxial relationship therewith; means for applying a voltage between said nozzle and electrode plate to create a first electric field therebetween having a high intensity, non-uniform component in the vicinity of said nozzle tip to form the liquid imaging material in said nozzle into a jet and to direct said jet through said hole of said electrode plate to said recording member; and means for applying a voltage to said ring to generate a second electric field of the



same polarity as the high intensity component of said first electric field in the vicinity of said nozzle tip to reduce the level of said high intensity component field and to impart uniformity to said high intensity component field thereby raising the voltage level at which jetting of said liquid imaging material from said nozzle tip occurs to interrupt said jet for recording an image on said recording member, said nozzle comprising:

a tubular element defining at one end thereof said open end tip of said nozzle and having a flat marginal end face at said one end, of a width less than 0.2 mm, the outer edge portion of said tubular element adjacent said one end and integrally joining said marginal end face being of arcuate shape and having a radius of curvature of less than 0.03 mm.

3,941,313

JET ENGINE NACELLE WITH DRAG AUGMENTER AUXILIARY FOR THRUST-REVERSER SYSTEM

Louis Francois Jumelle, Ris-Orangis, France, assignor to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

Continuation-in-part of Ser. No. 338,531, March 6, 1973. This application Nov. 29, 1974, Ser. No. 528,480

Claims priority, application France, Mar. 6, 1972, 72.07726

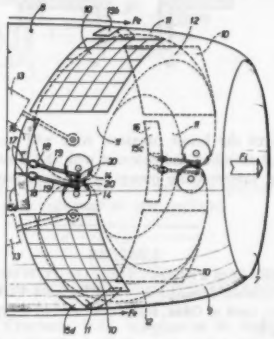
Int. Cl.[2] B64C *15/06*

U.S. Cl. 239—265.29 **9 Claims**

1. A nacelle housing a jet propulsion engine equipped with a rearwardly-directed jet propulsion nozzle and a thrust-reverser system actuatable to deflect laterally the engine exhaust flow from said jet propulsion nozzle, said nacelle having a streamlined outer surface so designed that in normal operation the relative flow of boundary air adheres thereto along substantially all its fore-to-aft extension including a rearwardly tapering aft-section which ends with a trailing edge around said jet propulsion nozzle and which presents two successive annular peripheral zones, namely:

a front annular peripheral zone located at a distance ahead of said trailing edge and comprising, in peripheral alternation, at least one thrust-reversal side outlet bounded circumferentially by two opposite arcuately-spaced edges and having a total passage area designed for issuing said laterally-deflected engine exhaust flow, and at least one solid impervious span between consecutive side outlet edges, extending over a sufficient segmentary extension of the periphery of said aft-section to shield effectively adjacent environment from said laterally-deflected engine exhaust flow, and

a rear annular peripheral zone extending between said front annular peripheral zone and said trailing edge and having a solid continuous outer surface subdividable into peripherally alternate first and second segments which lie respectively in longitudinal rearward extension of said thrust-reversal side outlet and of said solid impervious span, whereby said impervious span and said second segment in longitudinal rearward extension thereof form together a longitudinally-continuous solid stretch of the outer surface of said rearwardly tapering aft-section,



wherein the improvement comprises a controllable axuiliary device which is operatively associated with said solid stretch to act with respect thereto as a localized nacelle-streamlining destroyer, said device comprising:

transiently activatable means located adjacent said solid impervious span and extending substantially between said side outlet edges for positively causing said relative boundary airflow to separate from said second segment lying in longitudinal rearward extension of said solid imperivous span, and

control means for selectively activating said transiently activatable means in conjunction with the actuation of said thrust-reverser system, thereby switching said relative boundary airflow from an aerodynamic condition of flow adherence to said second segment, to an aerodynamic condition of flow separation therefrom.

3,941,314

NOZZLE ASSEMBLY FOR DISTRIBUTING FLUID

Gerald Moss, Oxford, England, and James Howard Taylor, Baton Rouge, La., assignors to The United States of America as represented by the Administrator of Environmental Protection Agency, Washington, D.C.

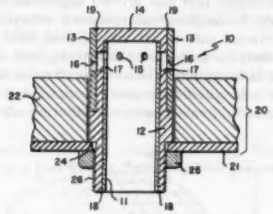
Filed Dec. 26, 1973, Ser. No. 427,864

Int. Cl.[2] B05B *1/14*

U.S. Cl. 239—553.3 **4 Claims**

1. A nozzle for distributing fluid from a higher pressure zone to a lower pressure zone at a relatively low velocity comprising: a first wall member having a plurality of fluid metering orifices, each metering orifice having an entrance for the ingress of fluid from the higher pressure zone; a second wall member having a plurality of fluid distributing orifices, each distributing orifice having an exit for the discharge of fluid to the lower pressure zone; and an intermediate means defining a plurality of apertures between the first and second wall members, said intermediate means and wall members being fixed relative to each other with contiguous regions of the wall members substantially parallel to each other and so arranged that each aperture of the intermediate means provides communication between one metering orifice and a single distrib-

uting orifice, each metering orifice being laterally offset relative to the distributing orifices with which it communicates, whereby, fluid passing from the higher pressure zone through



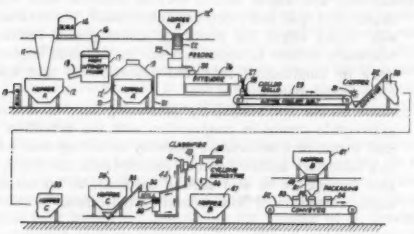
the nozzle to the lower pressure zone will impinge on the second wall member and interact with the fluid in the apertures of the intermediate means to dissipate energy from the fluid.

3,941,315

PROCESS FOR PRODUCTION OF POWDER PAINTS

Peter R. Gribble, Strongsville, and Edward V. Denino, North Royalton, both of Ohio, assignors to SCM Corporation, New York, N.Y.

Filed Feb. 6, 1974, Ser. No. 422,691
Int. Cl.[2] B02C *21/00*
U.S. Cl. 241—3 **1 Claim**



1. In a process for making powder paints from raw batch ingredients of resinous binder intimately blended with pigmentary solids within a batch blend unit wherein the blend is plasticized and homogenized to form a uniform blend, the uniform blend being extruded by mechanical extrusion, cooled, comminuted into powder paint, and packaged, the improvement which comprises:

providing a plurality of portable batch blend vessels for avoiding contamination between successive batches to collect said uniform blend and to collect said extrudate wherein a first portable batch blend vessel collects the uniform blend of raw batch ingredients from the batch blend unit and a second portable batch blend vessel collects the comminuted powder from the extruder;

moving the first portable batch blend vessel from said batch blend unit to the extruder for feeding the uniform blend of raw batch ingredients to the extruder; and

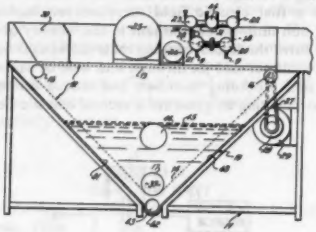
moving the second portable batch blend vessel containing comminuated powder from the extruder and transporting the powder paint to the packaging step for packaging.

3,941,316

APPARATUS FOR COMMINUTING AND EXTRACTING

Edgar M. Pierce, 4635 Drake Road, Cincinnati, Ohio 45243

Continuation-in-part of Ser. No. 408,595, Oct. 23, 1973, abandoned. This application Mar. 18, 1975, Ser. No. 559,546
Int. Cl.[2] B02C *19/00*
U.S. Cl. 241—15 **13 Claims**



12. The method of comminuting cellulosic material comprising the steps of:

rigidly supporting said material on a backing of sharp edges,

impacting said materail with water at a force of at least approximately 100 psi, and

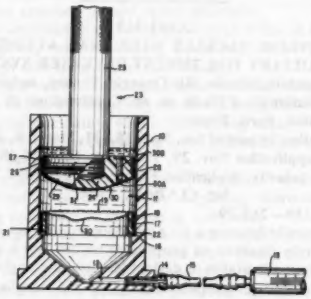
reciprocating a jet of water directed onto said material in a first direction to perform said impacting step and conveying said material past said reciprocating jet in a direction perpendicular to the direction of reciprocation.

3,941,317

METHOD AND APPARATUS FOR TISSUE DISAGGREGATION

Steven E. Kanor, Hastings-on-Hudson, N.Y., assignor to LNIH, Inc., Hastings-on-Hudson, N.Y.

Filed Oct. 26, 1973, Ser. No. 410,050
Int. Cl.[2] B02C *19/08*; B01L *3/00*
U.S. Cl. 241—21 **14 Claims**



1. A method of disaggregating cells without damaging the structure or antigenic properties of their cell membranes, comprising:

submerging the cells to be disaggregated in a physiologic liquid between two screen elements, the surfaces of which are formed of biologically inert material free of metal ions poisonous to cell membranes and at least one of which permits passage of disaggregated cells through it to a volume of such physiologic liquid; and

moving the screen elements relative to each other to disaggregate the cells for passage through said one screen element.

3,941,318

SYSTEMS FOR THE FEEDING OF PLASTICS MATERIALS TO PLASTICS WORKING MACHINES

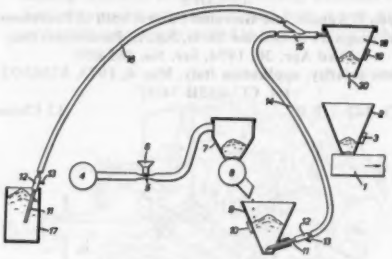
Maurice Gordon Ballinger, Stroud, and Raymond Mitchell Oakerbee, Slough, both of England, assignors to S.T.B. Engineering Limited, Stroud and Oaktree Equipment Limited, Slough, both of, England

Filed Feb. 20, 1974, Ser. No. 444,243

Claims priority, application United Kingdom, Feb. 22, 1973, 8843/73

Int. Cl.² B02C *19/12*

U.S. Cl. 241—101.4 10 Claims



1. A system for feeding plastics material to the inlet of at least one plastics working machine, said system comprising automatic means for removing plastics waste from the plastics working machine, a comminuting machine, a conveyor for feeding collected waste to said comminuting machine, a conveying mechanism for mixing the comminuted plastics waste and fresh plastics material, and container means for receiving the mixture from said conveying mechanism and for supplying the plastics working machine with the mixed plastics waste and fresh plastics material, said conveying mechanism comprising a first probe tube, a first container for comminuted plastics waste, said first probe tube projecting into said first container, a first venturi having one inlet connected to said probe tube and a second inlet connected to a source of air under pressure, said first venturi having an outlet, a hose connected to the outlet of said first venturi, a union connected to said hose, said conveying mechanism further comprising a second probe tube, a second container for fresh plastics material, said second probe tube projecting into said second container, a second venturi connected to said second probe tube and to a source of air under pressure, said second venturi being connected to said union, said union being coupled to said container means for supplying the mixed plastics waste and fresh plastics material to the inlet of the plastics working machine.

3,941,319

CUTTER RING HAVING DETACHABLE CUTTER PACKETS

Wilhelm Pallmann, Zweibrucken, Germany, assignor to Pallmann KG. Maschinenfabrik, Zweibrucken, Germany

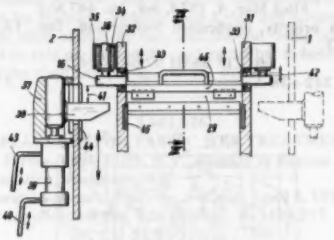
Filed July 5, 1974, Ser. No. 486,175

Claims priority, application Germany, July 5, 1973, 2334151

Int. Cl.² B02C *17/10*

U.S. Cl. 241—290 15 Claims

1. In a rotary cutting device; a housing, a pair of counterrotating cutter rings in concentric relation in said housing each comprising end members and circumferentially spaced axial elements extending between and connected to said end members, said elements on the radially outer ring comprising axial bar-like supports, a cutter packet on the radially outer side of each support, a clamping bar on the radially outer side of each packet, spring means urging each clamping bar into clamping pressure engagement with the radially outer side of each packet, and release means on the housing for engagement with



said clamping bars to move the bars into packet releasing position to permit exchange of said packets.

3,941,320

BRAKING DEVICE IN COIL SUPPORT FRAME OR CRADLE

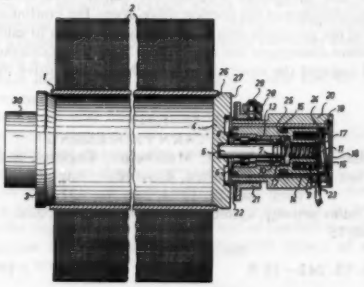
Toni Strunk, Charlotte, N.C., assignor to W. Schlafhorst & Co., Monchen-Gladbach, Germany

Filed Mar. 18, 1974, Ser. No. 452,144

Claims priority, application Germany, Mar. 16, 1973, 2313152

Int. Cl.² B65H *54/42, 49/26*

U.S. Cl. 242—18 DD 3 Claims



1. In a coil support frame of a winding machine having a pair of centering discs mounted in a position opposing one another and mutually spaced-apart means for urging at least one disc of the pair of centering discs toward the other so as to exert a clamping force on a coil core therebetween, at least said one disc of said pair of centering discs being rotatable, a braking device operatively connected to at least said one of the centering discs for braking rotation of the one centering disc and for applying pressure to the one centering disc in direction toward the other centering disc so as to reinforce the clamping force exerted by the pair of opposing centering discs on a coil core clamped therebetween.

3,941,321

WINDING DEVICE WITH AUTOMATIC TUBE CHANGE OPERATION

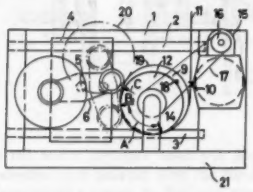
Peter Bosshard; Werner Portmann, both of Winterthur, and Olivier Wüst, Seuzach, all of Switzerland, assignors to Rieter Machine Works Ltd., Winterthur, Switzerland

Filed Mar. 4, 1974, Ser. No. 447,852

Claims priority, application Switzerland, Dec. 13, 1973, 17436/73

Int. Cl.² B65H 67/04, 54/42

U.S. Cl. 242—18 A 3 Claims



1. A winding device for endless threads or the like for automatically exchanging a fully wound bobbin tube against an empty tube, comprising a pivotable arm, at least two bobbin chucks for taking-up the tubes arranged upon said pivotable arm, an accelerating ring and a friction drive drum, the circumferential speed of the accelerating ring exceeding that of the friction drive drum, means for mounting the accelerating ring relative to the friction drive drum wherein the accelerating ring and the friction drive drum are arranged axially alongside one another such that the circumference of the accelerating ring radially extends partly beyond a portion of the circumference of the friction drive drum in the direction of the empty tube so as to be engaged thereby, and during the movement of the empty tube from a first position of pivotable arm movement wherein the empty tube contacts the circumference of the accelerating ring to a second position of the pivotable arm movement wherein the empty tube contacts the circumference of the friction drive drum, the continued pivoting of the pivotable arm from said first position to said second position disengages the empty tube from the accelerating ring and engages the empty tube with the friction drive drum.

3,941,322

TEXTILE YARN PROCESSING

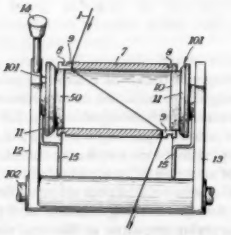
Arthur Raymond Hewitt, Manchester, England, assignor to Platt Saco Lowell Limited, Rossendale, England

Filed Jan. 29, 1974, Ser. No. 437,647

Claims priority, application United Kingdom, Jan. 31, 1975, 4840/75

Int. Cl.² B65H 67/04

U.S. Cl. 242—18 R 15 Claims



9. Apparatus for winding yarn on an empty bobbin comprising yarn delivery means for continuously delivering a running yarn, a bobbin tube, and bobbin supporting means supporting the bobbin tube, yarn collection means for collecting a running yarn delivered by said delivery means, yarn passage means formed in the bobbin tube defining a yarn engaging portion and providing means defining a clearance between the tube and the bobbin supporting means when the tube is supported thereon for the passage of the yarn through the bobbin tube to the yarn collecting means.

3,941,323

DEVICE FOR FINDING, EXTRACTING AND TEMPORARILY POSITIONING THE END OF THE YARN IN COPS

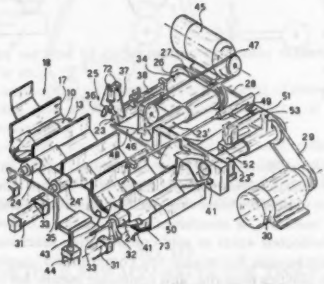
Armando D'Agnolo, and Giovanni Favero, both of Pordenone, Italy, assignors to Officine Savio, S.p.A., Pordenone, Italy

Filed Apr. 30, 1974, Ser. No. 465,690

Claims priority, application Italy, May 4, 1973, 83363/73

Int. Cl.² B65H 54/22

U.S. Cl. 242—18 R 13 Claims



1. A device for finding, extracting and temporarily positioning the end of the yarn in cops, wherein the cops are correctly oriented in the compartments of a conveyor which moves forward in steps, the compartments being substantially horizontal, and wherein the ends of the cops project from the two ends of the compartments, comprising a first station with opposed rotating mandrel and tailstock, said tailstock being axially movable, and with extraction grippers which move axially and transversely; a second station with opposed rotating mandrel and tailstock, said tailstock being axially movable, and with a vibrating eliminating spatula; a suction means positioned below said stations; a third station cooperating with said opening having a means for clamping a cop, a suction opening, shears and a means for retaining the end of the yarn; a fourth station with opposed rotating mandrel and tailstock, said tailstock being axially movable, and having a suction conveyor means, which has an axial slit; a means cooperating with said slit for positioning the end of the yarn, when found; and a plate means for lifting cops, which operates in cooperation with mandrels and tailstocks of the first, second and fourth stations and functions in a line outside the ends of movable compartments.

3,941,324

CABLE STRINGING APPARATUS

Lane A. Green, Longview, Tex., assignor to Superior Iron Works & Supply Company, Inc., Shreveport, La.

Filed Sept. 20, 1973, Ser. No. 398,828

Int. Cl.² B65H 75/00, 54/28, 59/16

U.S. Cl. 242—54 R 6 Claims

1. A cable stringing device comprising:

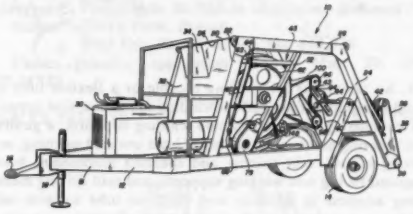
a supporting mobile frame;

cable reel support means including a cable reel spindle adapted to mount a reel having a cable receiving spool portion and reel drive means for rotating said spindle in one direction for payout and the opposite direction for take-up;

a bull wheel pivotally mounted to said frame having its pivotal axis substantially perpendicular to said spindle and having a portion adjacent said cable reel support means;

positioning means including a hydraulic cylinder having an extensible rod for pivoting said bull wheel about its axis, whereby said bull wheel portion transverses said reel spool;

a level wind mechanism for controlling the laying of cable onto said spool including limit sensing means to sense when the cable is wound to a predetermined position on said reel spool when said spindle is rotated in a cable take up direction and control means responsive to said limit sensing means to reverse the pivoting direction of said bull wheel upon actuation of said limit means whereby said cable is positively wound in reciprocating fashion on



said reel spool, said limit sensing means including a pair of pilot valves operatively positioned to control flow of pressure fluid to said cylinder and further including cam means carried by said extensible rod adapted to actuate one pilot valve upon extension and the other pilot valve upon retraction of the rod; and

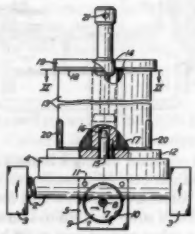
guide means for moving said bull wheel in response to the cable movement along the spool when said cable spindle is rotated in a payout direction of operation, said guide means including a control valve operatively connected to said cylinder having an extendible arm biased toward engagement with said cable, roller means carried on said arm engaging said cable, hydraulic pump means adapted to supply pressure fluid to said valve, and clutch means operatively connecting said pump to said reel drive whereby said guide means is operative only when said reel is operated in a payout direction of operation.

3,941,325

ARTICLE SUPPORT

Richard P. Krause, 1503 Highland Ave., New Castle, Pa. 16101

Filed Aug. 21, 1974, Ser. No. 494,381
Int. Cl.² B65H *19/00*
U.S. Cl. 242—55.54 **13 Claims**



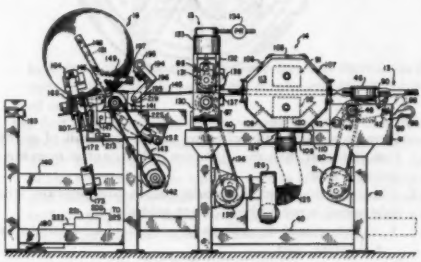
1. An article support comprising a shelf having front and rear ends and adapted to be supported by a horizontal bar spaced from a wall to which the ends of the bar are attached, a stabilizing member extending downwardly from the rear end portion of the shelf, an adjusting pin extending rearwardly through said stabilizing member and projecting from the front of that member, the pin being adjustable lengthwise in the stabilizing member, and a nut mounted on the pin in front of the stabilizing member, said stabilizing member and nut being adapted for insertion between such a wall and horizontal bar with the shelf above the bar, and the nut being adjustable forward on said pin toward the back of the bar to hold the rear ends of the shelf and pin against the wall.

3,941,326

APPARATUS FOR FABRIC WEB TREATMENT

Robert Frezza, Carle Place, N.Y., assignor to Samcoe Holding Corporation, Woodside, N.Y.

Continuation-in-part of Ser. No. 348,068, April 5, 1973. This application Aug. 5, 1974, Ser. No. 494,517
Int. Cl.² B65H *19/20, 17/08*
U.S. Cl. 242—56 R **6 Claims**



1. A semi-automatic batching and doffing means for winding fabric in batches, and of the type comprising

a. a controllably driven winding roll for supporting and driving a roll of winding fabric,

b. tiltable guide means for guiding the opposite ends of a fabric roll mandrel generally above said winding roll,

c. transverse fabric cutoff means on the downstream side of the winding roll for severing the fabric web after completion of a roll,

d. means for restarting the winding of a new roll; the improvement characterized by

e. cutoff transverse limit sensing means,

f. a vertically moveable air manifold means for vertically engaging and directing the cutoff end of the fabric web back and over a newly positioned winding mandrel; and

g. timer control means connected to said vertically moveable air manifold means and said sensing means, to actuate the engagement of the cutoff end of the fabric web in response to engagement by said cutoff means of said sensing means.

3,941,327

TAPE REEL POSITIONING AND LATCHING MEANS

Robert F. McCollum, Tulsa; Robert J. Jones, Bixby, and Philip E. Deck, Tulsa, all of Okla., assignors to Telex/Computer Products, Inc., Tulsa, Okla.

Filed Mar. 10, 1971, Ser. No. 122,740
Int. Cl. B65h *17/02*
U.S. Cl. 242—68.3 **8 Claims**

1. In a tape reel positioning and latching means, in which a reel is mounted on a hub plate fastened to the hollow shaft of a driving motor, the improvement comprising:

a. actuation rod means which passes through the central passage of said motor shaft, from the front of said motor toward the back thereof;

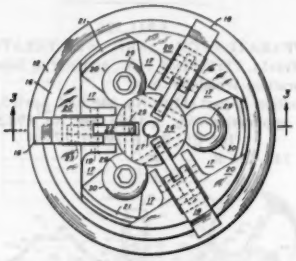
b. spool means mounted on one end of said rod at the front end of said motor, a plurality of operating links placed in

equally spaced radial planes and hinged at their first ends to said spool means;

c. said plurality of operating links hinged at their second ends to a corresponding plurality of operating dog means;

d. said plurality of operating dogs hinged to a corresponding plurality of shoe means adapted to slide in a radial direction;

e. elastic sleeve means surrounding said plurality of shoe means, said sleeve further guided so that its outer surface



forms a substantially circular cylindrical wall of slightly less diameter than the diameter of the central opening of the reel hub;

f. said links, dogs and shoes adapted, in combination, when said spool is pressed in toward said motor,

1. to rotate said dogs so as to press said reel hub to said hub plate, and

2. to force said shoes radially outward to compress said sleeve against said reel hub, to hold it in intimate, torque-transmitting contact.

3,941,328

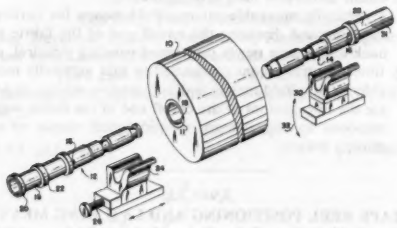
SUPPORT SHAFT APPARATUS

Dale E. Johnson, Box 231, McElhattan, Pa. 17748

Filed Apr. 15, 1975, Ser. No. 568,252

Int. Cl.² B65H *17/02*

U.S. Cl. 242—68.4 **8 Claims**



1. Apparatus for insertion into an axial bore in a rotating member, comprising a shaft housing, an adaptor having a portion disposed within said housing, an end piece having a portion in sliding engagement with said adaptor, a deflectable rubber bushing disposed about said end piece, and adjustment rod extending through said housing, said adaptor and said end piece and having an end portion contacting said end piece, means to prevent inadverent movement of said adaptor from within said housing, said adaptor being disposed essentially completely within said housing, and said housing being provided with a chamber for the reception of a portion of said end piece in telescoping engagement with said adaptor.

3,941,329

WINDING APPARATUS

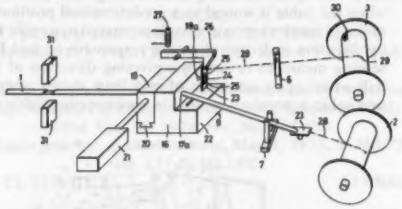
Charles E. Maillefer, Renens, and Rene Schlaeppi, Prilly, both of Switzerland, assignors to Maillefer S.A., Switzerland

Filed Feb. 4, 1975, Ser. No. 546,945

Claims priority, application Switzerland, Feb. 19, 1974, 2297/74; July 4, 1974, 9173/74

Int. Cl.² B21C *47/00*

U.S. Cl. 242—80 **12 Claims**



1. An apparatus for winding a cable or a flexible tube on winding supports mounted on winding-machines, said apparatus comprising at least two said winding supports, a guiding and shearing mechanism having at least one exit opening, and driving means, said guiding and shearing mechanism being disposed facing said winding supports, and said driving means being adapted to advance said cable or tube towards said guiding and shearing mechanism, further comprising a holding mechanism, control means, and, associated with each said winding support, a flexible connecting member, a grasping member, and traction means, each said grasping member being attached to one end of a respective connecting member, each said traction means being adapted to act upon the other end of a said connecting member for pulling the respective said grasping member towards the associated said winding support, said holding mechanism being adapted to hold any one of said grasping members in front of a said exit opening, and said control means being adapted to act upon said holding mechanism and said traction means for releasing a said grasping member and for setting the respective said traction means in motion.

3,941,330

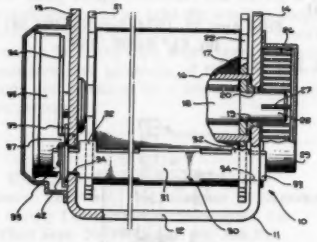
SAFETY BELT RETRACTOR

Charles J. Ulrich, Montecito, Calif., assignor to American Safety Equipment Corporation, Encino, Calif.

Filed Dec. 16, 1974, Ser. No. 532,881

Int. Cl.² B65H *75/48*

U.S. Cl. 242—107.4 R **10 Claims**



1. In a safety belt retractor having a frame comprising a pair of spaced flanges, a shaft extending transversely of said flanges and journalled for rotation thereon, a reel fixed to said shaft and having one end of a strap secured to said shaft and wound about said reel, the other end of said strap being adapted to extend outwardly of said flanges, a rewind spring operatively connected to both said frame and said shaft, at least one ratchet tooth gear mounted on said shaft and rotatable there-

with, a lockbar mounted on said frame and having at least one locking pawl thereon adapted to engage the teeth of said ratchet tooth gear, said lockbar being movable between positions engaging said teeth and out of engagement therewith, the improvement which comprises:

reel rotation preventing means associated with said frame for permanently deforming a portion of said frame in a manner preventing subsequent rotation of said reel thereby preventing said reel from rotation in either direction when said lockbar is in locking engagement with said gear and load is placed on said strap above a predetermined amount.

3,941,331

CASING FOR APPARATUS PROVIDED WITH A FLEXIBLE OR ARTICULATED WINDABLE ELEMENT

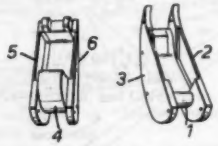
Georges L. Croullebois, 55, Bld de Charonne - Batiment "Les Aulnes", 75011 Paris, France

Filed Feb. 22, 1974, Ser. No. 444,730

Claims priority, application France, Mar. 29, 1973, 73.11252

Int. Cl.² B65H *75/20, 75/14*

U.S. Cl. 242—118 **8 Claims**



1. A casing, for the housing of apparatus which is provided with a windable element, said casing comprising

a central core with a surface of revolution defining an inner volume for said housing of apparatus, said core being formed of two hollow half-cylinders, each of said half-cylinders comprising two plane faces, said half-cylinders may be brought together to a closed position of said casing along a plane containing the common longitudinal axis of said half-cylinders and which may be moved relative to each other to an open position of said casing,

two substantially circular cheeks formed of two contiguous half-cheeks having a mean radius greater than that of the said half-cylinders, each one of the four said half-cheeks being integral with one of the two plane faces of one of the two hollow half-cylinders of the said central core,

an aperture located through the surface of revolution of said central core at a point where the said surface of revolution intersects the said plane, said aperture emerging in said inner volume, said aperture allowing passage of the said windable element the winding of which about the surface of revolution of the central core maintaining the casing in its closed position enclosing the said apparatus, the unwinding of the said windable element allowing the two hollow half-cylinders to break up, which allows egress of the said apparatus from within said casing.

3,941,332

ROTATIONAL POSITION SENSOR

Jerry Matula, Culver City, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Division of Ser. No. 331,371, Feb. 12, 1973, Pat. No. 3,828,188. This application July 30, 1974, Ser. No. 493,183

Int. Cl.² B65H *59/00, 59/38, 63/02*

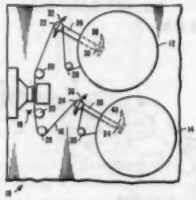
U.S. Cl. 242—189 **2 Claims**

1. A motion picture camera having a rotational position sensor comprising:

a light emitting diode;

first means mounting the light emitting diode substantially at an axis of rotation for movement about the axis of rotation;

a pair of generally planar photoelectric cells disposed within a common plane which is generally parallel to the axis of rotation and spaced therefrom by a distance substantially greater than any distance between the diode and the axis of rotation and the distance between the photoelectric cells, the photoelectric cells being operative to generate varying output signals in accordance with the amount of



light from the light emitting diode incident thereon as the light emitting diode undergoes movement about the axis of rotation; and

the first means includes a tension arm mounted for rotation about the axis of rotation and having the light emitting diode mounted thereon, the tension arm comprises part of the motion picture camera having a reel for supplying and taking up motion picture film and a servo system including a motor for driving the reel in accordance with the output signals from the photoelectric cells.

3,941,333

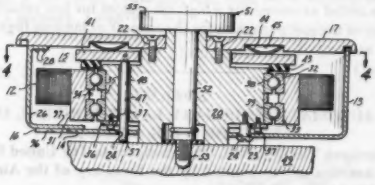
WEB CARTRIDGE

Ronald K. Carpenter, Los Angeles, and Gusti L. Ives, Ontario, both of Calif., assignors to Bell & Howell Company, Chicago, Ill.

Filed July 29, 1974, Ser. No. 492,800

Int. Cl.² B65H *49/18*

U.S. Cl. 242—197 **21 Claims**



1. A cartridge for a web, comprising in combination:

a casing having a first casing part for enclosing part of a web storage space, said first casing part having an access opening for said web storage space;

means for enclosing the remainder of said web storage space, including a second casing part being complementary to said first casing part whereby said first and second casing parts jointly enclose said web storage space, means for mounting said first and second casing parts for movement relative to each other between two positions, said mounting means including a core, means for mounting one of said first and second casing parts on said core, and means for mounting the other of said first and second casing parts to said core for movement relative to said core, and a door coupled to said second casing part for selectively closing said access opening upon relative movement of said first and second casing parts to one of said positions and for alternatively opening said access

opening upon relative movement of said first and second casing parts to the other of said positions; and

means in said web storage space for receiving a web in a wound condition.

3,941,334

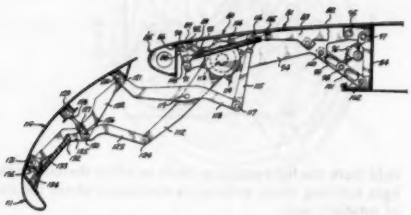
VARIABLE CAMBER AIRFOIL

James B. Cole, Mercer Island, Wash., assignor to The Boeing Company, Seattle, Wash.

Division of Ser. No. 455,837, March 28, 1975. This application Mar. 31, 1975, Ser. No. 563,428

Int. Cl.[2] B64C 9/24

U.S. Cl. 244—42 CA 10 Claims



1. A variable camber airfoil, comprising: an upper surface; a rib member hinged at its inner-end to relatively fixed structure of the airfoil for rotation in a chordwise plane and having its free-end extending outwardly therefrom toward the edge of the airfoil; means connecting the upper surface with the free-end of the rib member for support thereby; means for rotating the rib member about its hinged inner-end; means operatively associated with the means that impart rotational movement to the rib member for controllably bending the upper surface and thereby vary the camber of the airfoil; a contractable lower surface comprising a variable camber leading edge flap; flap actuating means connected to said rib member and independently operable of said rib member actuating means, for moving the variable camber flap from a stowed position within a leading edge portion of the airfoil envelope to an extended position; whereby, a net effective increase in airfoil planform area is provided in combination with an increase in camber of the airfoil envelope for a high lift system for low speed operation of the airfoil such as for the takeoff or landing flight speed of an aircraft.

3,941,335

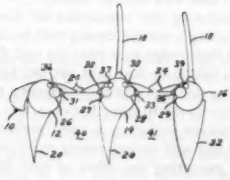
AUTOMATIC BOUNDARY LAYER CONTROL IN AN EJECTOR WING AIRCRAFT

Hermann Viets, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed June 19, 1975, Ser. No. 588,552

Int. Cl.[2] B64C 21/08

U.S. Cl. 244—42 CC 3 Claims



1. In an aircraft ejector wing having a plurality of spar members with air flow thrust channel being formed between pairs of spar members; means for providing closable inlets to said flow thrust channels; means for providing closable outlet diffuser doors for said thrust channels; means for providing a primary air flow through said thrust channels to thereby entrain a secondary flow through the thrust channels; said means for providing a primary air flow including a plurality of nozzles adapted to provide a flow of air into the boundary layer adjacent the opposite sides of said thrust channels; a plurality of pressure sensing ports in said thrust channels upstream of said nozzles; means responsive to the pressure at said sensing ports for controlling the flow from said nozzles into the boundary layer in said thrust channels.

3,941,336

AIRCRAFT AIR INTAKES

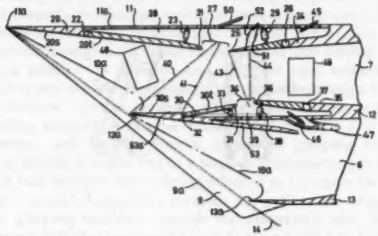
Rajendar Kumar Nangia, Bristol, England, assignor to British Aircraft Corporation Limited, London, England

Filed May 30, 1974, Ser. No. 474,856

Claims priority, application United Kingdom, May 31, 1973, 26136/73; Nov. 15, 1973, 53123/73

Int. Cl.[2] B64D 33/02

U.S. Cl. 244—53 B 6 Claims



1. An air intake arrangement for at least two jet propulsion engines for a supersonic aircraft

the air intake arrangement comprising:

means defining a first intake duct, including four bounding sidewall means in two pairs of opposing sidewall means defining a first forward facing intake duct mouth region of generally rectangular shape;

means defining a second intake duct, including four bounding sidewall means in two pairs of opposing sidewall means defining a second forward facing intake duct mouth region of generally rectangular shape;

the intake ducts being arranged in side-by-side relation, with one of said bounding side wall means of each of said intake ducts being a bounding sidewall means shared in common therebetween;

said bounding sidewall means terminating forwardly at respective leading edges,

the leading edge of the bounding sidewall means of the first intake duct which opposes the shared in common bounding sidewall means leading the leading edge of the shared in common bounding sidewall means, and therefore constituting a forward leading edge,

the leading edge of the shared in common bounding sidewall means leading the leading edge of the bounding sidewall means of the second intake duct which opposes the shared in common bounding sidewall means, and therefore constituting an aft leading edge,

said forward leading edge constituting shock wave forming means operative to generate at least one generally planar shock wave which, at least at the Design Mach Number of the air intake arrangement, extends obliquely and uninterruptedly across both the mouth region of the first intake duct and the mouth region of the second intake duct;

a first ramp member extending aft within the mouth region of the first intake duct from said forward leading edge;

a second ramp member extending aft within the mouth region of the first intake duct on the same sidewall means as the first ramp member, aft from the first ramp member;

a third ramp member extending aft within the mouth region of the first intake duct on said shared in common sidewall means from said shared in common leading edge;

the first, second and third ramp members being so spatially arranged that at the Design Mach Number of the intake arrangement, generally planar shock waves generated by said shared in common leading edge and said third ramp member extend obliquely across the first intake duct to lie between said first and second ramp members;

a fourth ramp member extending aft within the mouth region of the first intake duct on the shared in common sidewall means, aft from the third ramp member,

the second, third and fourth ramp members being so spatially arranged that at the Design Mach Number of the intake arrangement, a generally planar shock wave generated by said second ramp member extends obliquely across the first intake duct to lie between said third and fourth ramp members; and

pivot means respectively pivoting the second, third and fourth ramp members to the respective sidewall means on which they are provided, thereby permitting increasing and decreasing of angularity between the respective ramp members and sidewall means.

3,941,337

AIRPLANE STAIRWAY

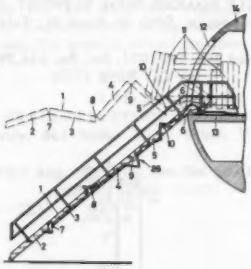
Gunther Mölter, Ottobrunn, and Gerd Cerne, Bremen, both of Germany, assignors to Messerschmitt-Bolkow-Blohm GmbH, Munich, Germany

Filed Mar. 13, 1974, Ser. No. 450,611

Claims priority, application Germany, Mar. 17, 1973, 2313319

Int. Cl.² B64C 1/24

U.S. Cl. 244—129 S **8 Claims**



5. An on-board collapsible stairway and stairway storage installation, for disposition transversely of an aircraft passenger compartment on an aircraft having a door opening thereinto, comprising:

guide means mounted inside said aircraft passenger compartment adjacent said door opening;

a collapsed stairway package means mounted on said guide means for movement between positions in front of said door and longitudinally spaced along side thereof in a direction parallel to the longitudinal axis of said aircraft, said collapsed stairway package means including collapsible stairway means; and

drive means for moving said collapsible stairway means between a collapsed position and a fully extended position extending out of said door down to ground level.

3,941,338

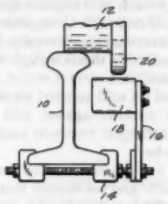
DIRECTIONAL WHEEL DETECTOR

Will B. Knudsen, Redding Ridge, Conn., assignor to Servo Corporation of America, Hicksville, N.Y.

Filed Sept. 25, 1974, Ser. No. 509,095

Int. Cl.² B61L 13/04

U.S. Cl. 246—77 **3 Claims**



1. A detecting system for determining the passage of a railroad car wheel along a section of track and the direction of movement of said wheel, said system comprising: a first wheel sensor mounted adjacent said track to generate a first signal upon the passage of a wheel past said first sensor and while said wheel remains within a length of track associated with said first sensor; a second wheel sensor closely spaced along said track from said first sensor to generate a second signal upon the passage of said wheel past said second sensor and while said wheel remains within a length of track associated with said second sensor; said first and second sensors being sufficiently closely spaced to each other so as to provide an overlap between said first and second signals as a wheel passes said first sensor toward said second sensor; logic circuit means connected to the outputs of said first and second sensors for determining the direction of travel of the wheel by sequence of outputs from said sensors, and first analog to digital converter means interposed between said first sensor and said logic means and a second analog to digital converter means interposed between said second sensor and said logic means.

3,941,339

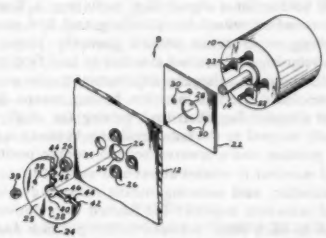
MOUNTING ARRANGEMENT FOR FAN MOTOR

William J. McCarty, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Apr. 25, 1975, Ser. No. 571,781

Int. Cl.² F16F 15/00; H02K 5/24

U.S. Cl. 248—15 **3 Claims**



1. A mounting arrangement for supporting a motor in a wall member comprising:

a. an electric motor having a rotatable shaft disposed in a substantially horizontal position and extending through a passageway in said wall member, and

1. a plurality of support elements on said motor extending parallel to and spaced equidistance from said shaft,

2. said support elements extending substantially centrally through aligned openings of equal number and spacing in said wall member;

b. a mounting member including a body portion having a collar projecting from said body portion arranged circumferentially around said shaft,

1. said collar being disposed in said passageway, and of a dimension to permit rotational movement of said mounting member relative to said wall member,
2. a plurality of sleeve means of equal number and spacing as said aligned openings projecting from said body portion through each said aligned opening of said wall into intimate contact with an opposing surface, and
3. said sleeve means having centrally located holes extending longitudinally therethrough for receiving said support elements, and
4. means arranged on said support elements for securing said mounting member against said motor with said wall member arranged between said motor and said mounting member;

c. retaining means being positioned so that said motor and mounting members are prevented from moving axially relative to said wall member; and

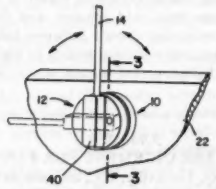
d. resilient means arranged between said sleeve means and their respective aligned openings for absorbing rotational motor torque vibration.

3,941,340

BOAT FLAG HOLDER

Leon B. Rankins, 6111 Hillside Drive, El Sobrante, Calif. 04803

Filed Sept. 9, 1974, Ser. No. 504,528
Int. Cl.² A01K 97/10
U.S. Cl. 248—40 **5 Claims**



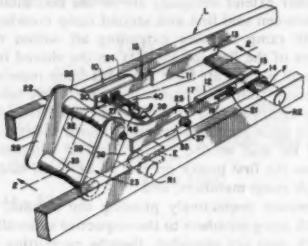
5. A holder for a signal flag, including: a first generally planar member; means for attaching said first member to a supporting structure; a second generally planar member; means securing said second member to said first member for rotation about an axis generally normal to the plane of said members; said second member having means for holding therein a signal flag shaft and moving the shaft in a plane generally normal to the rotational axis between a raised first signal position and a lowered second storage position as said second member is rotated about said axis with respect to said first member; said securing means mounting said first and second members together for limited axial movement with respect to each other between a first position and a second position; axially interengaging means between said first and second members for preventing relative rotation in said first position and freely permitting relative rotation in said second position; spring means biasing said first and second members into said first position, and comprising a plurality of axially extending blind bores in one of said members opening towards the other of said members, a compressed coil spring receiving within each of said blind bores; a bearing material plunger partially received within each of said blind bores for engaging at one axial end the respective coil spring and engaging at its other axial end the adjacent face of the other of said members.

3,941,341

QUICK-RELEASE ROLLER ATTACHMENT FOR SUPPORTING A ROPE OR HOSE AND THE LIKE ON AN AERIAL LADDER

Glenn F. Brogdon, Jr., 14505 Hamowell St., Manassas, Va. 22110

Filed Dec. 13, 1974, Ser. No. 532,728
Int. Cl.² H02G 3/04
U.S. Cl. 248—55 **10 Claims**



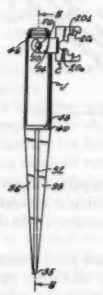
1. A quick-release roller attachment for supporting a rope or hose and the like on an aerial ladder, comprising: a first pair of spaced apart, substantially parallel side links; rung-engaging hook means carried by the side links at one end thereof; a pair of spaced apart, substantially parallel roller-supporting side plates pivotally connected between the ends thereof to the other ends of the side links; roller means carried by the side plates adjacent one end thereof and spanning the space therebetween in a position to support a rope or hose and the like thereon; a pair of side bars pivotally connected at one end thereof to the other ends of the side plates, and defining with the side plates and side links an over-center linkage means; and rung-engaging hook means carried by the other ends of the pair of side bars.

3,941,342

ADJUSTABLE SOAKER HOSE SUPPORT ASSEMBLY

Kenneth E. Bradshaw, 5101 W. Kent St., Santa Ana, Calif. 92704

Filed Jan. 28, 1975, Ser. No. 544,790
Int. Cl.² B05B 15/06
U.S. Cl. 248—88 **4 Claims**



1. In combination with a soaker hose having a plurality of longitudinally spaced water discharge openings therein, a plurality of support assemblies that may removably engage said hose to selectively hold the latter at any desired one of a plurality of possible positions relative to the earth surface when said support assemblies are partially embedded in the ground, each of said support assemblies including:

a. an elongate member having first and second longitudinal sides and that has a first upwardly disposable end portion and a second downwardly disposable portion, said second downwardly disposable portion tapering longitudinally and terminating in a generally pointed free end, and said member formed from a polymerized resin of sufficient strength that said second downwardly disposable portion may be at least partially embedded in the soil when a longitudinally directed force is applied to said first upwardly disposable end portion;

b. support means that can removably and transversely engage a segment of said soaker hose;

c. first means connected to said support means and pivotally secured to said upper portion to permit said soaker hose to be disposed at any desired one of a plurality of possible positions relative to said earth surface to permit water from said discharge openings to be directed onto a plurality of areas of said earth surface, said first means including:

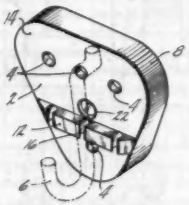
1. a bail secured to said support means and extending outwardly therefrom, said bail having a pair of oppositely disposed co-axially aligned openings therein, said bail formed from a resilient material;
2. a cylindrical shell having first and second ends;
3. a pair of pins that extend outwardly from said shell and pivotally engage said pair of openings, with said bail and shell having contacting surfaces, and said contacting surfaces having serrations defined thereon that pressure interlock to hold said bail and support means at the angle on said shell to which said bail is adjusted;
4. a stop that extends outwardly from said member at substantially the junction of said first upwardly disposable end portion and said second downwardly disposable portion, said stop rotatably engaged by said first end of said shell;
5. a cylindrical head on said first upwardly disposable end portion of said member, said head rotatably engaing the interior surface of said shell adjacent said second end thereof, said head having a circumferential groove therein, and said head of sufficient strength to receive hammer blows to drive said second portion of said support assembly into the earth; and
6. a snap ring that removably engages said groove to prevent said shell from being inadvertently displaced from said first portion of said member.

3,941,343

BRACKET SUPPORT ASSEMBLY

Ralph Kennedy, 461 Miller Road, South Windsor, Conn. 06074

Filed Aug. 30, 1974, Ser. No. 502,028
Int. Cl.² F16M *13/00*
U.S. Cl. 248—223 **5 Claims**



1. A bracket support assembly for an article holding bracket for use on a wall surface, comprising:

a semiflexible web having a first face and second face and having means for receiving and supporting a portion of an article holding bracket;

spacing means disposed on said web extending away from said first face of said web for spacing said web from a wall surface;

holding means disposed on said second face of said web having adjustable means for operatively receiving and retaining a portion of an article holding bracket; and

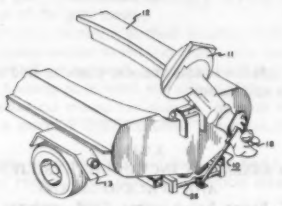
adjusting means disposed in said semiflexible web for adjusting the adjustable means of said holding means, said adjusting means comprising a boss disposed on said first face of said web, said boss extending a distance from said first face less than the distance said spacing means extends from said first face, whereby the force with which said holding means retains an article holding bracket may be adjusted.

3,941,344

MOTOR SUPPORT

Albert E. Paterson, 129 Madison, Twin Falls, Idaho 83301

Filed Apr. 20, 1973, Ser. No. 353,163
Int. Cl.² B63H *5/12*
U.S. Cl. 248—351 **1 Claim**



1. A motor support comprising a substantially U-shaped yoke; a pedestal which is fastened to the base portion of said yoke and retaining strap having means for detachably engaging said strap to said yoke wherein said means for detachably engaging said strap to said yoke includes a ring disposed centrally in each of the upstanding legs of said U-shaped yoke and a pair of hooks fastened to each of the terminal ends of said strap and which are engagable with said rings; and a swivel coupling which is mounted on the terminal end opposite said yoke of said pedestal, and comprises a substantially horizontally disposed plate fastened centrally in the rearwardmost terminal end of a boat trailer and a shaft being engagable with a hole in said plate disposed at a predetermined angle from the lowermost terminal end of said pedestal to project said pedestal at an upward outward predetermined angle with respect to said boat trailer, and having a collar disposed distally from the lowermost terminal end of said shaft.

3,941,345

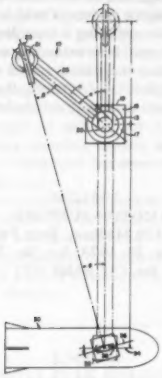
RADIAL ARM GUIDANCE PLATFORM TRACKER

William W. Stripling; Harold V. White, and Joe S. Hunter, all of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 28, 1973, Ser. No. 419,826
Int. Cl.² G01C *25/00*
U.S. Cl. 244—3.1 **2 Claims**

1. A radial arm tracker for aligning a platform of a missile; said radial arm tracker comprising an encoder that has a rotor and a stator, a radial arm having one end connected to said rotor and an opposite end with a telescope pivotally mounted

thereon, and a constant ratio drive system interconnecting said telescope and said stator of said encoder for pivoting said



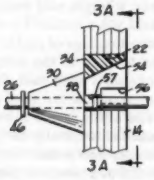
telescope relative to said encoder stator as said arm is rotated relative to said stator.

3,941,346

TIE ROD ASSEMBLY INCLUDING RESILIENT SEALING AND SPACING MEANS

Eugene K. Franc, San Anselmo, Calif., assignor to Construction Engineering Products, San Rafael, Calif.

Filed Sept. 13, 1974, Ser. No. 505,728
Int. Cl.[2] E04G 17/08
U.S. Cl. 249—40 5 Claims



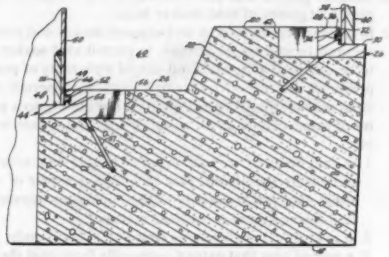
1. In combination with a pair of spaced apart wall forms, a tie rod and seal assembly comprising a generally elongated tie rod defining a pair of opposite ends, each end of which extends through a respective wall form bore in a respective one of said spaced apart wall forms for positioning said wall forms, each end of said rod having mounted thereon a cone for forming a depression, said cone being positioned on said rod against the interior wall of its respective wall form, and a generally cylindrical seal member of resilient material having a means defining a longitudinal slit extending the length of said seal member and including therein an asymmetrically placed seal bore dimensioned so as to closely accomodate said tie rod, said slit leading to said asymmetrically placed seal bore, said seal member being located within a respective bore, and further including projection means on said rod for expanding said seal member against the interior of a respective bore.

3,941,347

COMPOSITE CONCRETE AND STEEL PALLET FOR FORMING ONE END OF CONCRETE PIPE

Harry H. Robertson, San Pedro; Donnie H. Hicks, Huntington Beach, and Hugh M. Hofmann, La Habra, all of Calif., assignors to Ameron, Inc., Monterey Park, Calif.

Filed Nov. 6, 1974, Ser. No. 521,351
Int. Cl.[2] B28B 21/02
U.S. Cl. 249—204 5 Claims



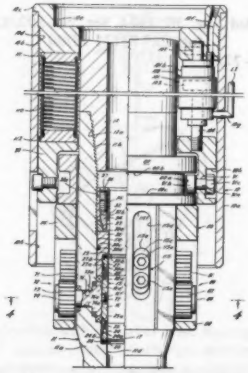
1. A composite pallet for forming one end of a cast concrete pipe, the pallet comprising a concrete base having an annular portion shaped to form the end of the pipe, an outer annular ring bonded to the base around the outer periphery of the annular portion, and an inner annular ring bonded to the base around the inner periphery of the annular portion, the two rings each being spaced from each other and of a material more chip-resistant than the concrete base, the outer ring being shaped to receive one end of an outer cylindrical form, the inner ring being shaped to receive one end of an inner cylindrical form.

3,941,348

SAFETY VALVE

James D. Mott, Houston, Tex., assignor to Hydril Company, Houston, Tex.

Continuation of Ser. No. 267,509, June 29, 1972, abandoned.
This application May 7, 1974, Ser. No. 467,657
Int. Cl.[2] F16K 31/143; E21B 33/00; F16L 5/00
U.S. Cl. 251—58 1 Claim



1. A remotely operable valve for controlling flow of fluid through a rotating tubular member, comprising:

a stationary housing section comprising a generally tubular assembly;

a rotatable tubular housing section having a flow passage formed therein, said rotatable housing section movably mounted with said stationary housing section to enable relative circumferential rotation of said rotatable housing section with respect to said stationary housing section;

bore closure means mounted with said rotatable housing for controlling flow of fluid through said flow passage by movement of a flow controlling member to and from an open position for enabling flow of fluid through said flow passage and a closed position for blocking flow of fluid through said flow passage;

actuating means operably connecting said stationary housing section with said bore closure means for moving said flow control member to and from the open and closed position, said actuating means including;

an actuating assembly rotatable with said rotatable housing section and mounted for longitudinal movement with respect to said rotatable housing section for controlling movement of said flow controlling member, said actuating assembly having first and second shafts rotably mounted with said rotatable tubular housing section and operably engaging said flow controlling member on opposite sides of said member for effecting desired flow controlling movement of said flow controlling member when said first and second shafts are rotated, each of said shafts mounting a pivot pin in an eccentrically position with respect to the axis of rotation of said shaft for imparting operating movement to said flow controlling member when said shafts are rotated;

said actuating assembly including:

an actuating sleeve positioned about said rotatable housing section, said actuating sleeve being generally tubular and disposed concentrically outwardly of said rotatable housing section and mounted for slidable longitudinal movement with respect thereto;

gear means operably connecting said actuating sleeve with said first and second shafts for rotating said first and second shafts upon longitudinal movement of said actuating sleeve;

support means supporting actuating sleeve for rotation with said rotatable housing section and for movement longitudinally with respect thereto and being disposed concentrically outwardly of said rotatable housing section and including bearing means mounting said actuating sleeve for rotation with said rotatable housing section wherein said actuating sleeve is movable longitudinally with respect to said rotatable housing section and rotates therewith so that said gear means moves said flow controlling member between said open and said closed positions;

operating means disposed between said stationary housing section and said support means and operably connecting said stationary housing section and said actuating assembly for operably moving said actuating sleeve longitudinally with respect to said rotatable housing section to rotate said first and said second shafts to move said bore closure means to the open and closed positions while enabling relative circumferential rotation between said operating means and said actuating assembly, said operating means including primary power means operable from a point remote from said valve for moving said actuating assembly to effect movement of said flow controlling member to and from the open and closed position and secondary power means for moving said actuating assembly to effect movement of said flow controlling member to the closed position when said primary power means fails;

said actuating sleeve including an elongated slot therein; and

a disc element mounted on said rotating housing section and extending into said slot wherein longitudinal movement of said actuating sleeve with respect to said rotating housing is limited.

3,941,349

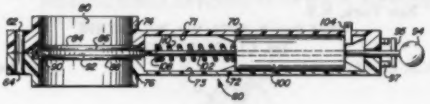
ELECTROMECHANICALLY ACTUATED GATE VALVE APPARATUS

Michael L. Pierson, 3714 W. Morten, Phoenix, Ariz. 85009

Filed July 3, 1974, Ser. No. 485,513

Int. Cl.² F16K 31/10

U.S. Cl. 251—100 **3 Claims**



1. Electromechanical valve apparatus for use with a holding tank of a recreational vehicle, comprising, in combination:

housing means secured to the holding tank including a passage for the flow of fluids therethrough;

gate means secured to the housing means and movable with respect to the passage to control the flow of fluids through the passage, including a valve gate, a rod secured to the valve gate and movable relative thereto for moving the valve gate, and a handle secured to the rod for manual actuation of the gate means;

locking means including a portion secured to the housing and a portion secured to the rod engageable upon relative movement of the rod with respect to both the valve gate and the housing to prevent movement of the valve gate;

electromechanical means for moving the gate means, including a solenoid disposed about a portion of the rod; and

switch means for connecting and disconnecting a source of electrical energy to the electromechanical means.

3,941,350

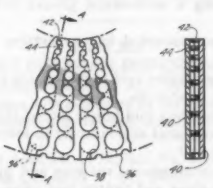
QUIETING MEANS FOR A FLUID FLOW CONTROL DEVICE USING VORTICAL FLOW PATTERNS

Matthew L. Kluczynski, Chatsworth, Calif., assignor to The Bendix Corporation, North Hollywood, Calif.

Filed Mar. 4, 1974, Ser. No. 447,697

Int. Cl.² F16K 47/08

U.S. Cl. 251—127 **3 Claims**



1. In a flow path including an entry opening to said flow path:

a valve means for closing said opening in variable degrees;

a means for controlling the flow through said opening comprising a stack of laminar members across said opening having abutting faces, including a first group of members having elongated passageways therethrough each of said passageways defining a substantially cylindrical chamber and a radially directed passage intersecting said cylindrical chamber tangentially, with adjacent pairs of said first group being positioned radially such that the cylindrical chambers in said adjacent members are axially aligned and vortical flow patterns are produced in said chambers, but with the said radially directed passages being connected oppositely to said chambers to produce reversals

in direction of flow near the exit of each of said pairs of cylindrical chambers; and

a second group of laminar members which have no communication with said chambers and passages and which abut against the opposite faces of said first group of members to confine flow to a plurality of generally serpentine paths across said stack.

3,941,351

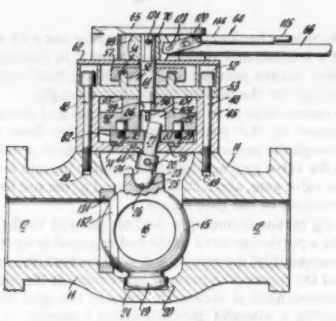
BALL TYPE VALVE WITH HIGH PRESSURE SEALING CAPABILITY

William J. Graham, Metairie, La., assignor to Texaco Inc., New York, N.Y.

Filed Dec. 9, 1974, Ser. No. 530,896

Int. Cl.² F16K *25/00*

U.S. Cl. 251—161 **4 Claims**



1. In combination with a ball type valve for use in high pressure or severe conditions, said valve having a valve handle and a spherical core cooperating with a valve seat in a body with a fluid passage there through, said core being rotatable about an axis transverse to said fluid passage and having an opening there through for alignment with said passage when in the fully open position, and said core being also rotatable a limited amount about another axis tangential to said core for forcing it against said seat, the improvement comprising

means for actuating said core with less than a half turn of said handle for each of said rotations,

said core actuating means comprising,

a short stem on said core coaxial with said transverse axis and having a diametrical groove across the free end thereof,

toggle means mounted in cooperative relation with said groove,

means for mounting said toggle means for coaxial rotation with said short stem,

means for pivoting said toggle means about an axis parallel to said tangential axis in order to force said core against said seat, and

means for alternatively rotating and pivoting said toggle means to close and tighten said valve.

3,941,352

BUMPER SCREW JACK

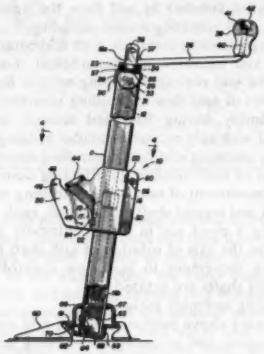
R. Harlan Nehrig, Stevensville, and Nicholas J. White, St. Joseph, both of Mich., assignors to Auto Specialities Manufacturing Company, St. Joseph, Mich.

Filed Oct. 2, 1974, Ser. No. 511,442

Int. Cl.² B66F *3/08*

U.S. Cl. 254—98 **5 Claims**

1. A lifting jack comprising: an upstanding hollow strut member having a longitudinal opening along one side, a screw rod rotatably disposed in said strut member, support means at the upper end of the strut member and screw rod for supporting the screw rod in the strut member, the support means including a cap secured to the top of the strut member and having a flat top, first and second flat disk members directly atop the cap each having flat bearing surfaces and a washer element directly atop the flat disk member, the washer element including a flat bearing surface for engaging a disk and a noncircular recess at least partly defined by bevelled bottom surfaces, the screw rod being formed with shoulder portions bevelled to fit into the washer element noncircular recess and mate with the recess bottom surfaces so as to cause the washer element to rotate in unison with the screw rod, the support means thereby providing a first planar frictional bearing interengagement plane between the directly and abuttively interengaging washer element and the first flat disk, a second planar frictional bearing interengagement plane between the directly and abuttively interengaging first flat disk and second flat disk,



and a third planar frictional bearing interengagement plane between the directly and abuttively interengaging second flat disk and flat cap top, the lifting jack further including load-lifting means interconnected with the screw rod for movement longitudinally of the screw rod upon screw rod rotation, the load lifting means including spaced apart side wall members on opposite sides of and exterior to the strut member, and unitary planar glide members each fixed in the load lifting means between mounting slots in the side wall members and having enlarged portions extending between the side wall members to slidably bear against the upstanding strut member and encourage easy motion of the load lifting means up and down the strut member.

3,941,353

DEVICE FOR RELEASABLY HOLDING A MOVABLE BODY

Eugen Hack, Nurnberg, Germany, assignor to Georg Muller Kugellager-Fabrik KG, Nurnberg, Germany

Filed Oct. 16, 1974, Ser. No. 515,357

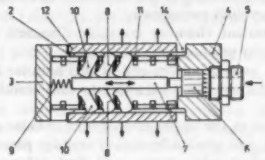
Claims priority, application Germany, Oct. 22, 1973, 2352836

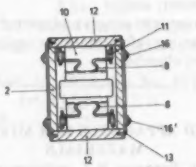
Int. Cl.² B66F *3/00*

U.S. Cl. 254—124 **10 Claims**

1. In a device for releasably holding at least one movable body at a given position with respect to another body, a pair of opposed end walls which are spaced from each other, a pair of opposed elongated fixed walls also spaced from each other and extending between and being fixed to said end walls for forming therewith a frame which surrounds a given space, a pair of opposed parallel clamping walls extending across said space between said fixed walls and at least one of said clamping walls being completely separate from and unconnected to any of the other walls so as to be freely movable away from the other of said clamping walls to a position where said one movable clamping wall is adapted to press against the movable body for releasably holding the latter, a control plate situated

in said space between and extending parallel to and being spaced from said clamping walls with said control plate having a pair of opposed faces which are respectively directed toward inner surfaces of said clamping walls which are directed toward each other, a pair of rows of tiltable spreading means one of which is a mirror image of the other, said rows being respectively situated on opposite sides of and engaging said faces of said control plate and having distant from the latter end surfaces engaging said inner surfaces of said clamping walls, a plurality of spring means respectively cooperating with said spreading means for urging the latter to tilt, in response to movement of said control plate in a clamping direction between said end walls, in a direction spreading said one clamping wall away from the other clamping wall, while remaining parallel thereto, to a location adapted to press against





a movable body for releasably holding the latter, urging means operatively connected at least with said one clamping wall for displacing the latter with respect to said fixed walls back toward the other clamping wall to a location adapted to release the movable body for movement, in response to movement of said control plate in an opposite, non-clamping direction between said end walls, said urging means being the only structure which maintains said one clamping wall assembled with the other structure and in engagement with said end surfaces of one of said rows of tiltable spreading means, and moving means operatively connected with said control plate for moving the latter in said clamping direction or in said nonclamping direction to situate at least said one movable clamping wall either in a holding position, adapted to hold the movable body against movement, or in a release position, adapted to release the body for movement, respectively.

3,941,354

ANTI TWO-BLOCKING DEVICE

Marshall A. Paige, Clinton, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 25, 1975, Ser. No. 552,896
Int. Cl.² B66D *1/00*
U.S. Cl. 254—135 R **4 Claims**

1. A fail-safe cutter device for securing onto a cable and preventing loss of a payload due to "two-blocking" which comprises:

a cylindrical elongated member having a conical upper end section;

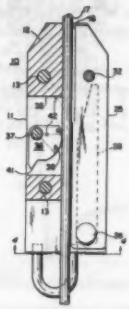
a first slot along the length of said cylindrical member along a diameter thereof with equal dimensions on each side of the diameter;

said slot extending from the outer surface through the axis of said member to a depth greater than the radius of said cylindrical member thereby forming first and second substantially semi-cylindrical sections;

said first semi-cylindrical section having a length which is less than that of said second section;

a second linear slot having the same width as said first slot extending from the opposite outer surface of said cylindrical member toward the axis thereof joining said first slot in alignment therewith;

a cutter secured within said second slot and adapted for rotational movement relative to the axis of said cylindrical member;



an anvil of substantially the same length as said second section secured at one end to said second semi-cylindrical section below the lower end of said first section for rotational movement into said first slot;

a clamping arm secured relative to said second semi-cylindrical section parallel with said anvil for movement relative to said second section;

an eccentric pin;

said eccentric pin securing said anvil to said second section with said clamping arm fixedly secured to said eccentric for rotation therewith;

means for securing said anvil within said first slot relative to said cutter;

whereby a cable along the axis of said cutter device will be clamped between said cutter and said anvil.

3,941,355

MIXING INSERT FOR FOAM DISPENSING APPARATUS

William G. Simpson, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed June 12, 1974, Ser. No. 478,800
Int. Cl.² B01F *15/00*; B67D *5/60*
U.S. Cl. 259—4 AC **1 Claim**

1. An apparatus for mixing ingredients in a fluid state for producing foam comprising:

an elongated housing having a cylindrical bore extending therethrough;

a mixing insert being unitary and carried within said cylindrical bore;

said mixing insert including an elongated shaft-like member;

a series of longitudinally spaced radially extending discs carried on said shaft-like member;

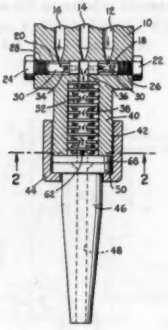
the outer diameter of each of said discs corresponding to the diameter of said bore;

each of said discs having a slot extending from an outer periphery of said disc for fluid passage therethrough;

said slots of alternate discs being positioned substantially 180° from each other;

the entire space around said shaft-like member between said discs being unobstructed whereby said ingredients may flow around said shaft-like member in either direction;

means for supplying said ingredients into said elongated housing whereby said ingredients flow from one end of said housing to the other thereof as it flows through said slots of alternate discs with said ingredients being divided and recombined as it flows around said shaft-like member;



an inlet passage for said ingredients extending axially from one end of said shaft-like member and laterally through the periphery of said shaft-like member into the space between the first two discs at said one end of said shaft-like member;

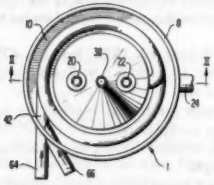
an outlet passage for said ingredients at the other end of said shaft-like member beyond the last of said slotted discs extending laterally to the center of said shaft-like member and axially out of said other end of said shaft-like member.

3,941,356

METHOD AND APPARATUS FOR CONTINUOUS MIXING OF BLOOD PLASMA AND ADDITIVES

William H. Mason, Woodbridge, Conn., assignor to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Filed Nov. 13, 1974, Ser. No. 523,533
Int. Cl.² B01F 7/20
U.S. Cl. 259—7 15 Claims



1. An apparatus for the continuous mixing of blood plasma with additives such as alcohol and for cooling said mixture comprising;

a first product chamber having first and second ends;

a first inner coolant chamber coaxially disposed internal to said first product chamber;

a first outer coolant chamber coaxially disposed external to said first product chamber;

input means for introducing plasma and at least one additive such as alcohol into said first product chamber at said first end thereof;

means for mixing the plasma and the additive, said means being located in said first product chamber near the first end thereof;

first inlet means and first outlet means for creating a flow of refrigerant through said first inner coolant chamber;

second inlet means and second outlet means for creating a flow of refrigerant through said first outer coolant chamber; and

a product outlet connected to said first product chamber at said second end thereof.

15. A device for use in blood plasma fractionation for continuously cooling blood plasma without entrapment of air, comprising:

an annular product passageway having a top end and a bottom end;

an inner coolant chamber coaxially disposed internal to said annular product passageway;

an outer coolant chamber coaxially disposed external to said annular product passageway;

inlet means at said bottom end of said annular passageway for introducing blood plasma into said annular passageway;

outlet means at the upper end of said annular passage for removing said plasma from said annular passageway;

first refrigerant inlet means and first refrigerant outlet means for passing refrigerant into and out of said first coolant chamber; and

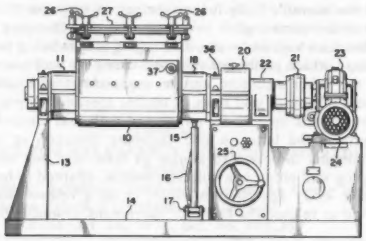
second refrigerant inlet means and second refrigerant outlet means for passing refrigerant into and out of said second outer coolant chamber.

3,941,357

METHOD AND APPARATUS FOR MIXING VISCOUS MATERIALS

William O. Wurtz, Paramus, N.J., assignor to Willow Technology, Inc., New York, N.Y.

Filed Oct. 7, 1974, Ser. No. 512,822
Int. Cl.² B01F 7/04
U.S. Cl. 259—104 10 Claims



1. An apparatus for mixing viscous materials comprising:

a container;

a pair of spaced-apart shafts pivotably disposed through said container, and defining a zone of interaction between the axes of said shafts;

a plurality of double-wedge working tools each comprising two substantially triangular planes inclined relative to each other and connected at one edge thereof, said working tools being connected to the periphery of each shaft in spaced-apart relationship so as to overlap in the zone of interation;

drive means coupled to each of said shafts for moving the shafts and the working tools oppositely with respect to each other so that adjacent working tools of the shafts co-act in mixing the viscous material.

10. A method of mixing viscous, shear sensitive materials in a double mixing container comprising the steps of:

interacting the material between a pair of oppositely driven shafts in the mixing container, with working tools so that mechanical forces are applied through these working tools to move individual particles and layers of material, in oblique directions, the resultant force having component forces exerted in directions circularly, laterally, and toward the center of the container;

randomly dividing the individual particles by means of the working tool and imparting varying velocity and velocity paths to the particles so as to promote constant and positive recirculation of all particles of the batch;

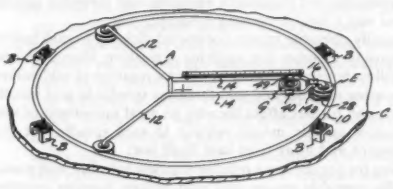
radially inverting the individual particles of the material so as to change its direction, path of travel and velocity so that mechanical shear forces imparted by the working tool, as well as hydraulic shear forces created by the particles of the material slipping on each other by their different velocities, are averaged over an extremely short period of time;

averaging and making uniform the shear stresses resulting from the mechanical and hydraulic shear forces, for each particle, whereby as a result of the uniform work input, uniform temperature gradient, uniform shear stress, a uniform and predictable viscosity throughout the complete batch of shear sensitive material is provided.

3,941,358
CUTTING TORCH GUIDE

Lawrence M. Darling, 306 Goldenrod Ave., Corona Del Mar, Calif. 92625

Filed Apr. 24, 1975, Ser. No. 571,270
Int. Cl.² B23K 7/10
U.S. Cl. 266—23 E **5 Claims**



1. In combination with a cutting torch, a device that is removably securable to a steel sheet for guiding said cutting torch in a circular path of desired radius to form a circular opening in said sheet, said device including:

a. a ring shaped track;

b. magnetic means for holding said track at a desired location on said sheet and in spaced relationship thereto;

c. a frame assembly disposed within said track, said assembly including two parallel laterally spaced guides that on first ends thereof develop into two angularly positioned arms, said two arms on the free ends thereof developing into two first shafts disposed within said track, a tubular collar disposed between said guides and secured to the ends thereof opposite that from which said arms extend;

d. a second shaft having an extension normally disposed thereto, said extension adjustably mounted in said collar;

e. two first grooved rollers rotatably supported on said first shafts and a second grooved roller rotatably supported on said second shaft, said first and second rollers in engagement with the interior surface of said track;

f. first means for selectively locking said second shaft extension at a desired position relative said collar to maintain said first and second grooved rollers in engagement with said track;

g. a carriage slidably mounted on said guides;

h. rotatable means on said carriage that may be engaged by said cutting torch;

i. visual means for indicating the distance of said carriage supported rotatable means from the center of said track;

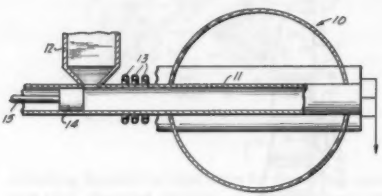
j. second means for locking said carriage at a position determined by use of said visual means to rotate said carriage through a circular path relative to said track for said torch to cut an opening of desired radius in said sheet; and

k. heat shield means situated between said second roller and carriage to protect said second roller and second shaft from heat from said cutting torch.

3,941,359
APPARATUS FOR DIRECT REDUCTION OF IRON OXIDES

Gerald T. Shinville, Sterling, and Linden P. Proeger, Prophetstown, both of Ill., assignors to Northwestern Steel and Wire Company, Sterling, Ill.

Filed Dec. 12, 1974, Ser. No. 531,883
Int. Cl.² F27B 9/02, 9/10, 9/12
U.S. Cl. 266—24 **3 Claims**

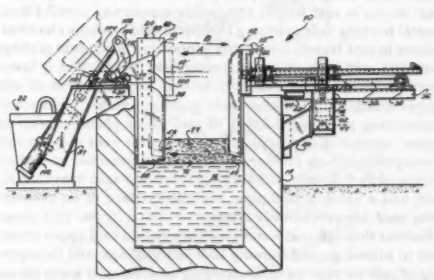


1. An apparatus for reducing oxides of iron which comprises a large diameter flue for directing high temperature flue gases therethrough, at least one conduit extending transversely through said flue so as to expose its entire periphery to the hot gases passing through said flue, said conduit having a generally elliptical cross-section with the major axis parallel to the axis of said flue, and feeding means for introducing a particulate charge of iron oxide and a carbonaceous reducing agent through said conduit.

3,941,360
MECHANICAL SKIMMER

Albert I. Blank, Lyndhurst, Ohio, assignor to Chase Brass & Copper Co., Incorporated, Cleveland, Ohio

Filed Dec. 16, 1974, Ser. No. 532,854
Int. Cl.² C21C 7/00
U.S. Cl. 266—37 **10 Claims**



1. A device for removing dross from the surface of molten metal in a furnace comprising, a dross pusher head, means for reciprocating said pusher head across the molten metal in the furnace from one side of said furnace to the other; a pivotally mounted scoop having an open side and being normally posi-

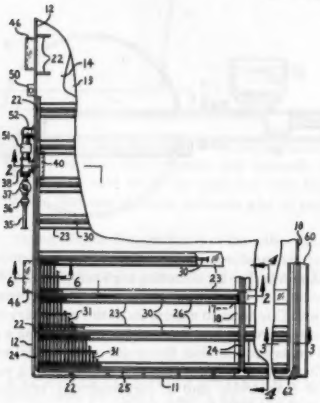
tioned at least partially within said furnace opposite said pusher head to receive dross pushed by said head; and means for pivoting said scoop from said position within the furnace through a predetermined angle to discharge dross contained therein outside of the furnace.

3,941,361

WATER-FILLED BURNING TABLE

George Edward Cranston, Ioco, Canada, and Jack Milton Moody, Milwaukie, Oreg., assignors to Cranston Machinery Co., Inc., Oak Grove, Oreg.

Filed Nov. 29, 1974, Ser. No. 528,353
Int. Cl.² B23Q 23/00
U.S. Cl. 269—15 4 Claims



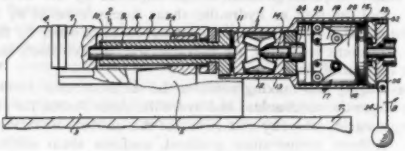
1. A burning table comprising a water tank having a closed pressure chamber in its lower portion and an open working chamber in its upper portion, means supporting horizontal removable frames in an upper portion of said working chamber, means in said frames removably supporting parallel horizontal burning rails spanning the top of said working chamber, means in said frames removably supporting horizontal gratings between said rails, a water passageway connecting a lower portion of said lower chamber with an upper portion of said upper chamber just below said gratings, an air passageway connecting an upper portion of said lower chamber with an upper portion of said upper chamber, an air vent valve in said passageway, an air pressure supply pipe connected to said air passageway between said air vent valve and said lower chamber, and a valve in said pipe, the introduction of air pressure into said lower chamber displacing water from said lower chamber through said water passageway into said upper chamber to submerge said burning rails and gratings, and the opening of said air vent valve discharging air from said lower chamber and any water in said air passageway through said air passageway into said upper chamber and allowing return of water from only the upper portion of said upper chamber through said water passageway to said lower chamber until the water level in said upper chamber is just below said gratings.

3,941,362

CLAMPING DEVICE, IN PARTICULAR A MACHINE VISE

Franz Arnold, Kempten, and Peter Preisenhammer, Kempten-Lenzfried, both of Germany, assignors to Saurer-Allma GmbH, Allgaeuer Maschinenbau, Kempten, Germany

Filed Sept. 9, 1974, Ser. No. 504,533
Claims priority, application Germany, Sept. 17, 1973, 3337118
Int. Cl.² B25B 1/14
U.S. Cl. 269—32 13 Claims



1. A spindle device for use in a mechanical clamping device having a fixed jaw and a movable jaw, comprising:

a threaded spindle nut secured to said fixed jaw and being spaced therefrom;

hollow spindle means rotatably mounted in said spindle nut, said hollow spindle means including a unitary threaded spindle having an axially extending hole through the center thereof threadedly engaging said threaded spindle nut and a hollow housing member;

manually operable means connected directly to said hollow housing member for applying a positive torque to said hollow housing member to effect a rotation of said hollow housing member and said threaded spindle in said spindle nut and further effect thereby an axial movement of said hollow spindle means relative to said spindle nut and toward and away from said fixed jaw;

means for preventing a relative rotation between said manually operable means and said hollow housing member during a use of said manually operable means;

a pressure rod reciprocally mounted in and coaxial with said hole in said threaded spindle and movable with said hollow spindle means, an end of said pressure rod engaging said movable jaw, an opposite end of said pressure rod being located in said hollow housing member and having a head member thereon whereby an application of torque to said manually operable means will effect a rotation thereof about an axis common to said axis of said threaded spindle and an adjustment of said movable jaw toward said fixed jaw to clamp a workpiece therebetween;

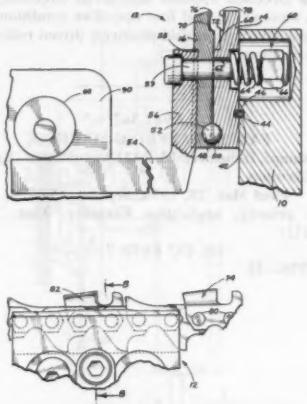
external fluid pressure operated force applying means mounted in said hollow housing member adjacent said manually operable means for applying an axially directed force inside said hollow housing member, said fluid pressure operated force applying means having axially reciprocal output means thereon; and

first and second series connected power amplification means symmetrically arranged in said hollow housing member about said axis of said threaded spindle and rotatable therewith about said axis for transmitting the axial force from said output means to said head member on said pressure rod, said first and second power amplifier means providing a two-stage amplification in the axial force from said output means.

3,941,363
POSITIONING CLAMP

Dustin Lance Ogg, Milwaukie, Oreg., assignor to Carlton Company, Portland, Oreg.

Filed Nov. 4, 1974, Ser. No. 520,291
Int. Cl.² B25B *1/04*
U.S. Cl. 269—100 **6 Claims**



1. In a clamp adapted to hold an elongate workpiece with such indexed relative to a work station for the workpiece, said workpiece having an irregular contour in a direction extending along the length thereof with portions recurring along its length having matching contour,

a first jaw member,

releasable means for fixing said first jaw member in different adjusted positions relative to said support,

a second jaw member and means mounting said second jaw member on said first jaw member accommodating movement of the second member toward and away from the first member to effect clamping and release of a workpiece, respectively, said means mounting said second jaw member comprising a ball pivot mounting accommodating swinging of the second jaw member in a swing direction extending toward the first jaw member and limited pivotal movement laterally of said swing direction,

biasing means urging said second jaw member toward the first jaw member,

said first and second jaw members having shaped opposed face portions complementing the contour of said recurring portions of the workpiece and tending to seat over such a portion of the workpiece when clamping onto the workpiece thus to orient the workpiece relative to the jaw members.

3,941,364
ADJUSTABLE SHAFT REST ASSEMBLY

Victor S. Hjelm, Stratford, and John H. Rohles, Orange, both of Conn., assignors to Eldorado Tool and Manufacturing Corporation, Milford, Conn.

Filed June 5, 1974, Ser. No. 476,425
Int. Cl.² B23Q *3/06;* **B25B** *5/10*
U.S. Cl. 269—156 **9 Claims**

1. An adjustable shaft rest assembly for securely clamping a workpiece to a fixture table or the like comprising

a base,

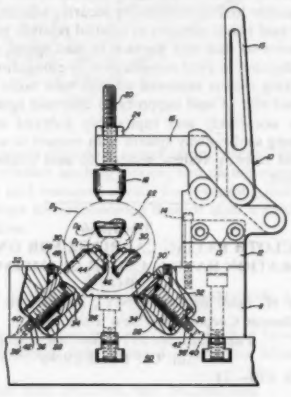
a clamp mounted on said base and including a clamp head selectively axially advanceable from a first position to a second position,

a first pair of bores defined in said base with the axes thereof being angularly related and intersecting the axis of a clamped workpiece, said bores including first and second coaxial portions,

first and second threaded studs including a first threaded portion and a second portion selectively configured for insertion into said second base bore portions,

first and second shaft rests,

said shaft rests being selectively configured for insertion into said first portion of said first pair of base bores and



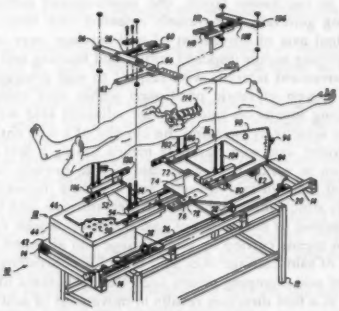
including threaded central bores for threadedly receiving said first threaded portion of said first and second threaded studs,

said base including a threaded bore angularly intersecting said second portion of each of said first pair of base bores and a pair of set screw means for selected advancement into said pair of threaded base bores for fixedly locating said threaded studs.

3,941,365
SUPPORT AND MANIPULATION TABLE FOR SPINAL EXAMINATION AND EXPERIMENTATION

Willard W. Frymoyer, 43 Granite St., Foxborough, Mass. 02035

Filed Mar. 29, 1974, Ser. No. 456,046
Int. Cl.² A61G *13/00*
U.S. Cl. 269—325 **10 Claims**



1. A support table for use in supporting, positioning and manipulating a body during examination of the spinal regions of said body by means of radiographic examination equipment and the like, comprising:

a rigid base having an elongate runway system thereon;

a pelvic support for supporting the pelvic regions of the body, said support being slidably mounted on said rigid base for motion along said runway system;

a thoracic support for supporting the thoracic regions of the body so that a portion of the spinal region of said body between said supports is easily accessible for examination purposes, said thoracic support being slidably mounted on said rigid base for independent motion along said runway system in the same manner as said pelvic support;

releasable locking means for securing said thoracic support to said pelvic support to control relative motion therebetween so that said portion of said spinal region may be subjected to axial compression or elongation forces; and

indexing means mounted to said base table for moving at least one of said supports so that said spinal region may be accurately and repeatably indexed and positioned along said runway system with respect to a fixed point on said runway system related to said examination equipment.

3,941,366

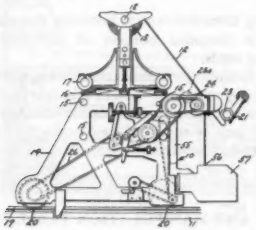
CLOTH LAYING CARRIAGE FOR ONE WAY OPERATION HAVING CLOTH CLAMPING CUTTING BOX

Jerome H. Feld, Brooklyn, N.Y., assignor to Cutting Room Appliances Corporation, New York, N.Y.

Filed Jan. 24, 1974, Ser. No. 436,150

Int. Cl.[2] B65H 29/46

U.S. Cl. 270—31 7 Claims



1. In a fabric spreading machine carriage including means for supporting a web of fabric for dispensing in successive layers upon the surface of a cloth laying table disposed therebeneath, a positively driven roller entraining said web, and moving the same in linear correspondence to reciprocal movement of said carriage over said table for deposition upon said table in successive layers, the improvement comprising: a housing generally transversely oriented with respect to the principal axis of movement of said carriage over said table, web cutting means disposed within said housing and arranged for movement laterally with respect to said principal axis to sever a web of fabric positioned within said housing, web clamping means on said carriage adjacent said web cutting means selectively engaging the cut end of a web entrained on said roller, said web clamping means having a first operative position in which it engages said web to prevent movement thereof through said housing, and a second inoperative position in which movement of said web through said housing is in response to movement of said positively driven roller; first switch means carried by said carriage and actuated by movement of said carriage over said table for controlling the position of said clamping means such that movement of said carriage in a first direction results in movement of said clamping means to said first position, and movement of said carriage in a second opposite direction results in movement of said clamping means to said second position; said positively driven roller having clutch means for disengaging said roller from driven movement, and second switch means controllig operation of said clutch means between engaged and disengaged positions, said second switch means being controlled by movement of said carriage over said table; the relationship between said first and second switch means being such that during movement of said carriage in a given direction, said clamping means is in second inoperative position, and said clutch means is engaged whereby said positively driven roller moves said web through said housing, and during movement of said carriage in a direction opposite said given direction, said web clamping means is in said first operative condition, and said clutch means disengages said positively driven roller from the driven movement.

3,941,367

FABRIC LAYERING MACHINE

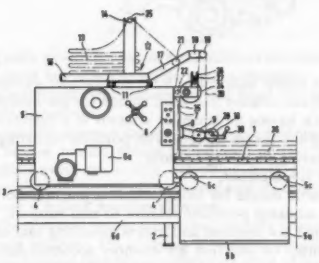
Gunter Stumpf, Hohenweg 13, 7421 Mehrstetten (Kr. Munsingen), Germany

Filed Mar. 28, 1974, Ser. No. 455,734

Claims priority, application Germany, Mar. 30, 1973, 7312182[U]

Int. Cl.[2] B65H 29/46

U.S. Cl. 270—31 12 Claims



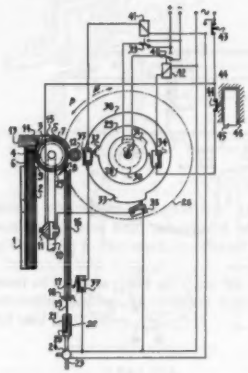
1. A fabric layering machine for movement along a layering table, comprising a frame, mounting means carried by said frame for mounting a supply of a web of fabric, a pair of rotatable draw-off rollers positioned in proximity to each other so as to form a fabric-engaging nip therebetween and being detachably mounted in an operative position on said frame, guide roller means detachably fastened on said frame above said draw-off rollers for guiding said fabric web into the nip between said draw-off rollers, and power means operable to rotate said draw-off rollers in opposite senses to each other for pulling through said nip said web of fabric extending from said supply of fabric, a feed roller carried by said frame and disposed to feed said web towards the nip between said draw-off rollers, further power means operable to rotate said feed roller for feedinng forward said web, a deflection roller carried by said frame and disposed proximate the surface of said feed roller for causing said web to contact said feed roller over an arc of contact, a pressing roller carried by said frame for cooperating with said deflection roller when said web extends around said feed roller so as to cause said web to contact said feed roller, and adjustable holding means for holding the pressing roller for adjusting the position of said pressing roller relative to said feed roller, said detachably mounted guide roller means and draw-off rollers adapted to be selectively removed and replaced by other operative components for converting said machine from single-layer fabric to tubular fabric operation, and reversely.

3,941,368

FILM TRANSPORT MECHANISM

Joseph Munch, Deurne, Belgium, assignor to Compagnie Generale de Radiologie, Paris, France

Filed Oct. 7, 1974, Ser. No. 512,870
Claims priority, application Belgium, Oct. 12, 1973, 53142
Int. Cl.² B65H 5/12, 7/16
U.S. Cl. 271—5 7 Claims



1. An X-ray film transport apparatus, comprising in combination:

a. a housing;

b. a hollow cylinder, arranged to rotate within said housing and equipped with means for the evacuation of air therefrom;

c. a transport roller arranged to rotate within said housing, in cooperation with said hollow cylinder;

d. a film loading cartridge containing sheets of film, placed within the housing, adjacent to said hollow cylinder;

e. drive means for rotating said hollow cylinder to advance the film sheet for exposure;

f. means for initiating the return motion of the sheets of film from the apparatus after exposure thereof; and

g. means for controlling the feed of the sheets of film in said film loading cartridge seriatim for exposure whereby the top sheet of film in said film loading cartridge is aspirated to the surface of said hollow cylinder after evacuation of some air therefrom, and is transported between said hollow cylinder and said transport roller to be exposed, whereupon said means for initiating the return motion of the film are engaged and the motions of said hollow cylinder and said transport roller are reversed for transporting the film out of the apparatus.

3,941,369

SHEET DISTRIBUTING APPARATUS

Thomas R. Cross, Rochester, and Clifford L. George, Macedon, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 9, 1974, Ser. No. 530,906
Int. Cl.² B65H 31/24
U.S. Cl. 271—64 5 Claims

1. Sheet sorting apparatus comprising:

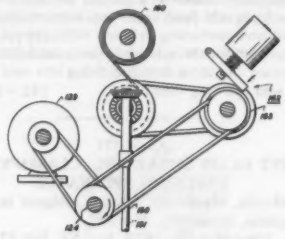
a plurality of bins for receiving copy sheet,

transport means for advancing sheets along a path past the inlets of the bins,

screw means extending in the direction of said transport means adjacent thereto,

carriage means including a plurality of deflector members supported by said screw means and adapted to be moved by rotation thereof,

drive means for rotating said screw means to advance the carriage means past the inlets of the sorting bins,



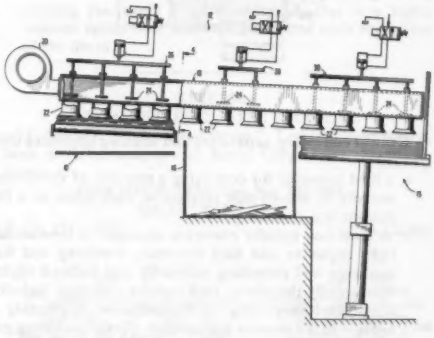
said drive means including motor spring means driving a single revolution latching device, and clutch means connected to said transport means for rewinding said motor spring means for retensioning thereof after a sorting run past the bins.

3,941,370

SHEET GLASS - CONVEYING, CLASSIFYING AND STACKING APPARATUS

John Martin, and Enrique Peyrani Osorio, both of Monterrey, Mexico, assignors to Fabricacion de Maquinas, Monterrey, Mexico

Filed Feb. 24, 1975, Ser. No. 552,288
Int. Cl.² B65H 29/62, 29/32
U.S. Cl. 271—64 4 Claims



1. Sheet conveying, separating and stacking apparatus comprising:

a. a feed conveyor for conveying a plurality of sheets horizontally in side-by-side relation to each other in a first straight line direction;

b. at least one transfer conveyor arranged at substantially right angles to said feed conveyor overlying said feed conveyor and extending outwardly and inclined slightly downwardly therefrom, said transfer conveyor including a manifold supporting on its underside, a plurality of nozzles in a common plane, each nozzle including passageways for directing air under pressure parallel to said common plane and valve means for selectively establishing fluid communication between groups of said nozzles and the interior of said manifold;

c. a stack receiving means positioned beneath and adjacent the lower end of said transfer conveyor;

d. a reject bin positioned beneath said transfer conveyor between said stacking means and said feed conveyor;

e. said feed conveyor including means for changing the plane of travel of sheets thereon from horizontal to a

plane substantially parallel to the plane of said nozzles at the location of said transfer conveyor; and

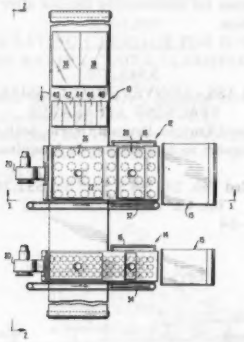
f. means for pressurizing said manifold; whereby operation of said valve means is effective to selectively pick up sheets from said feed conveyor, support them in closely spaced non-contacting relation with respect to said nozzles and permit them to slide down said incline while so supported and to be dropped either into said reject bin or onto said stacking means.

3,941,371

SHEET GLASS CONVEYING, CLASSIFYING & STACKING APPARATUS

John K. Martin, Monterrey, Mexico, assignor to Fabricacion de Maquinas, Monterrey, Mexico

Filed Mar. 20, 1975, Ser. No. 560,375
Int. Cl.² B65H *31/24, 29/24*
U.S. Cl. 271—64 **4 Claims**



1. Sheet conveying, separating and stacking apparatus comprising:

a. a feed conveyor for conveying a plurality of sheets horizontally in side-by-side relation to each other in a first straight line direction;

b. at least one transfer conveyor arranged at substantially right angles to said feed conveyor, overlying said feed conveyor and extending outwardly and inclined slightly downwardly therefrom, said transfer conveyor including a manifold supporting on its underside, a plurality of nozzles in a common plane, each nozzle including passageways for directing air under pressure parallel to said common plane and valve means for selectively establishing fluid communication between groups of said nozzles and the interior of said manifold;

c. a stack receiving means positioned beyond that end of said transfer conveyor which is remote from said feed conveyor;

d. a reject bin positioned beneath said transfer conveyor between said stacking means and said feed conveyor;

e. said feed conveyor including means for changing the plane of travel of sheets thereon from horizontal to a plane substantially parallel to the plane of said nozzles at the location of said transfer conveyor; and

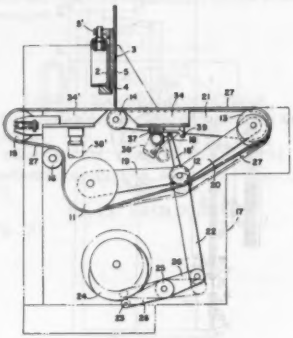
f. means for pressurizing said manifold; whereby operation of said valve means is effective to selectively pick up sheets from said feed conveyor, support them in closely spaced non-contacting relation with respect to said nozzles and permit them to slide down said incline while so supported and to be dropped either into said reject bin or permitted to fly free from the end of said transfer conveyor to said stack receiving means.

3,941,372

FEEDING APPARATUS FOR CORRUGATED CARDBOARD SHEETS

Masaharu Matsuo, No. 3-17, 3-Chome, Higashi Komagata, Sumida, Tokyo, Japan

Filed Apr. 14, 1975, Ser. No. 567,884
Claims priority, application Japan, May 4, 1974, 49-49268
Int. Cl.² B65H *3/12*
U.S. Cl. 271—95 **8 Claims**



1. Sheet feeding apparatus comprising:

a. a support;

b. gate means mounted on said support and bounding a receptacle space in a predetermined direction, said space being adapted to hold a stack of sheets;

c. a continuous, perforated, elongated belt;

d. guide means on said support guiding said belt in a closed, longitudinal loop,

1. said belt in a portion of said loop bounding said receptacle space transversely to said direction for supporting said stack and having a front part adjacent said gate means and a rear part remote from said gate means,

2. said guide means including shifting means for shifting said rear part back and forth between an operative position in which said rear part is aligned with said front part in the direction of elongation of said belt, and an idling position spaced from said operative position outward of said receptacle space,

e. drive means for continuously moving said belt in said loop in a direction from said rear part toward said front part;

f. suction means for drawing air from said receptacle space through the perforations of said front part; and

g. control means operatively connected to said suction means and to said shifting means for operating the same in timed sequence, said suction means being actuated by said control means when said rear part is in said operative positions, and said perforations in said front part being vented to the atmosphere by said control means when said rear part is in said idling position.

3,941,373

FLOATING GATE SHEET SEPARATOR

Klaus K. Stange, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 25, 1974, Ser. No. 527,114
Int. Cl.² B65H *5/02*
U.S. Cl. 271—124 **2 Claims**

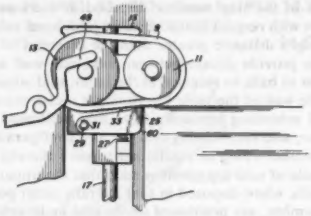
1. An apparatus for feeding and separating individual sheets from a stack of sheets including:

a first feed roll disposed adjacent the forward edge of the stack;

a second roll disposed adjacent said first feed roll;

a feed belt mounted on said first and second rolls for movement therearound;

a narrow, low friction feed gate disposed adjacent one corner of the front edge of the stack adapted to locate the front edges of the sheet in the stack; and,



biasing means adapted to bias said feed gate into engagement with said feed belt, movement of said feed belt causing the sheet in the stack in contact therewith to be forced between said feed gate and said feed belt for movement of a single sheet off from the stack, said feed gate preventing passage of multiple sheets between said gate and said feed belt.

3,941,374

ARRANGEMENT FOR THE STACKWISE DEPOSITING OF SEPARATE EQUALLY-LONG SHEETS ON A REPOSITORY

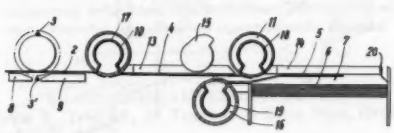
Hilmar Vits, Leichlingen, Germany, assignor to VITS-Maschinenbau GmbH, Langenfeld, Germany

Filed Sept. 24, 1974, Ser. No. 508,910

Claims priority, application Germany, Sept. 26, 1973, 2348320

Int. Cl.² B65H *29/68*

U.S. Cl. 271—183 **8 Claims**



1. In an arrangement for the stackwise depositing of separate equally long sheets, including a sheet transporting arrangement having at least one rotatable vacuum conveying means, said transporting arrangement being adapted to convey successively inserted sheets from an input to a repository at a predetermined conveying speed and in a predetermined plane of conveyance; a brake arrangement located along the path of conveyance upstream of said repository for deflecting an end of each sheet downwardly out of the plane of conveyance so as to reduce the conveying speed to a speed facilitating an undisturbed depositing of said sheets in said repository; and means for interrupting the suction effect of the vacuum conveying roll located proximate said braking arrangement during effective periods of the latter, the improvement comprising: said rotatable vacuum conveying means proximate said brake arrangement being perforated along a portion of its periphery and being rotated in rhythm with insertion of said sheets so that the perforated peripheral portion of said rotatable vacuum conveying means rotates in synchronism with the leading portion of each said sheet and the unperforated portion thereof faces towards the end of each said sheet upon the end of the sheet being in the effective region of the operative brake arrangement in rhythm with said sheet insertion.

3,941,375

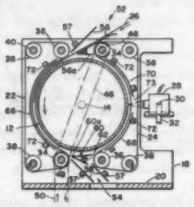
PAPER TRANSPORTER

Eric L. La White, S. Royalton, Vt.; Ernest G. Henrichon, Jr., Wellesley Hills, and Harvey J. Bloom, Bellingham, both of Mass., assignors to Xicon Data Entry Corporation, Newton Upper Falls, Mass.

Filed June 10, 1974, Ser. No. 477,809

Int. Cl.² B65H *9/16*

U.S. Cl. 271—251 **8 Claims**



1. A transporter of paper for use in conjunction with an optical character reader comprising,

a drum freely rotatable about its central longitudinal axis,

a reference edge located proximate one end of the drum and lying in a plane that is substantially transverse to said longitudinal axis, and

means for gripping a narrow edge portion of the paper that is substantially free of print, said gripping means dynamically adjusting the paper against said reference edge as said drum and said paper rotate over a first portion of each revolution of the drum and said gripping means rotating said drum and the paper together at a highly uniform speed over a second portion of each revolution of the drum.

3,941,376

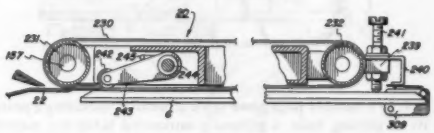
AUTOMATIC DOCUMENT HANDLER

Karl E. Liechty, Pittsford, and David C. Lasher, Canandaigua, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 8, 1972, Ser. No. 250,905

Int. Cl.² B65H *5/02*

U.S. Cl. 271—275 **5 Claims**



1. In a document handling apparatus for bringing documents into copying position on the platen of a document copying machine, the combination of:

a flexible document transport belt;

a pair of interior support rolls about which said belt is operatively disposed, said support rolls being spaced apart whereby to provide in cooperation with said transport belt a belt operating run opposite to and extending across at least a portion of said platen;

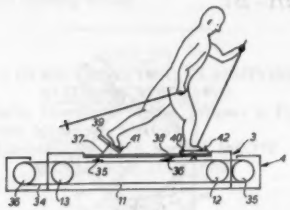
means for rotatably supporting each of said rolls so that the surface of said transport belt therearound is spaced slightly above the plane of said platen whereby said belt operating run would ordinarily be spaced above and out of document driving relationship with said platen; and

internal pressure means adapted to force a line portion of said belt operating run downward toward said platen into document driving relationship with said platen.

3,941,377
APPARATUS FOR SIMULATED SKIING

Hakon Lie, Beitostolen Helsesportsenter, 2953 Beitostolen, Norway

Filed Nov. 19, 1974, Ser. No. 525,125
Int. Cl.² A63B 69/18
U.S. Cl. 272—57 B **4 Claims**

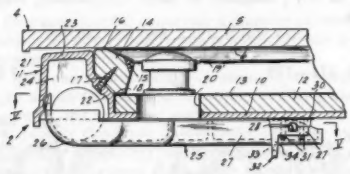


1. Apparatus for simulated skiing comprising a pair of assemblies each comprising a frame, at least two rollers rotatably mounted in parallel for rotation in said frame, an endless flexible element mounted on said rollers for movement around said rollers, a foot plate assembly adapted to accommodate and support a skier's foot, means for transmitting a skier's leg movements from said foot plate to said element, an adjustable brake to provide adjustable resistance to said movement of said element and one way drive means between said brake and said element to permit movement of said element free from said adjustable resistance in one direction, said frame having stop means restricting movement of said foot plate.

3,941,378
CONVERTIBLE POOL-DINING TABLE WITH RETRACTABLE BALL BOX

Stuart C. Bagley, Glen Ellyn, Ill., assignor to Armac Enterprises, Inc., Chicago, Ill.

Filed Jan. 20, 1975, Ser. No. 542,364
Int. Cl.² A63D 15/04
U.S. Cl. 273—5 R **19 Claims**

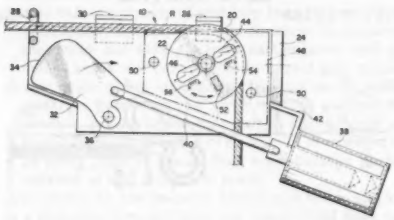


1. In a bumper pool game table structure, including a plurality of playing balls, a generally horizontal table top member and a structure for supporting said top member in operative position, particularly a convertible table structure in which persons may be seated thereat, for dining or other purposes, the combination of said top member having a horizontally extending planar playing surface bounded by upwardly extending peripheral side walls, at the inner sides of which are disposed bumper members defining the operative periphery of the playing area, said playing surface having a plurality of bumper posts disposed thereon in predetermined relation, and having at least one ball-receiving aperture extending through the top member adjacent a peripheral edge of the table, a relatively shallow generally flat tray member, disposed below said aperture, and adapted to retain a plurality of said playing balls of said bumper pool game, said balls being of such a size in relationship to the depth of said tray member that when said balls are retained in said tray member, their upper portions extend above the peripheral edges of the tray member, the latter being supported by said table structure for selective movement from a first generally horizontal position in whic said tray member is disposed closely adjacent the underside c said top member, with the laterally outer portion of the tra member disposed directly below the adjacent peripheral sid wall of the table top, to a second ball return position, in whicl balls passing through said aperture will be received in said tra and may move to said laterally outer portion, with the latte portion of the tray member disposed in downwardly spacec relation with respect to the adjacent peripheral side wall of the table top a distance greater than the diameter of the playing balls to provide access between said side wall and the tray member to balls so received in the latter, said adjacent peripheral side wall of the table top having a recess therein opening on and extending upwardly from said underside of said top member, said recess being of a size and configuration and said tray member being so positioned relative thereto and to said underside of said top member such that the upper portions of said balls, when disposed in said laterally outer portion of the tray member, are positioned above said underside of said top member and in said recess when the tray member is in said first position, thus providing storage of said balls in said tray member and said recess whereby said tray member, when in said first position, while disposed adjacent the peripheral edge of the table top, is at a height at which it will not interfere with adequate leg and knee room for occupants seated at the table.

3,941,379
PIN ROPE CONTROL

Helmut Paul Paule, King Side Road, King City, and Oskar Leonard Kinzler, Blue Star Acres, South Road, Oak Ridges, both of Canada

Filed Sept. 9, 1974, Ser. No. 504,421
Claims priority, application Canada, Sept. 19, 1973, 181448
Int. Cl.² A63D 5/08
U.S. Cl. 273—44 **13 Claims**



1. A pin rope control for use in motorized pin setting apparatus wherein said pins are attached to ropes, said control comprising;

supporting means;

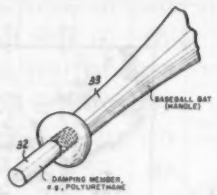
a pulley wheel mounted thereon around which a said rope runs in both forward and reverse directions, said pulley wheel being freely rotatable in either direction in response to any movement of said rope either in the forward or reverse direction and being free of any interruption by any other means thereby permitting the pulley wheel to stop at any random position in response solely to said rope and permitting said pulley to start rotation freely without restraint in response to movement of said rope, and,

remote sensing means free of any mechanical connection with said pulley and responsive only to movement of said pulley wheel from any random at rest position to generate at least one signal, said signal being operative to trigger operation of said motorized pin setting apparatus and said remote sensing means being inoperative to trigger such operation while said pulley wheel is at rest.

3,941,380
TENNIS RACKETS AND SIMILAR IMPLEMENTS WITH VIBRATION DAMPER

Francois René Lacoste, Neuilly, Hauts de Seine, France, assignor to Patentex S.A., Fribourg, Switzerland

Filed July 12, 1973, Ser. No. 378,713
Claims priority, application France, July 31, 1972, 72.27538; Oct. 20, 1972, 72.37231; June 6, 1973, 73.20527
Int. Cl.² A63B *59/06, 49/02*
U.S. Cl. 273—72 A **24 Claims**



1. An elongated sports implement comprising a striking portion at one end and a handle portion of lesser breadth than said striking portion at its other end, said implement having a longitudinal axis which passes through said striking portion and said handle, said implement being subject in use to significant vibration extending to said handle portion from impacting contact with a game ball at said striking portion, said vibration being transverse to said longitudinal axis and having an alternating series of two nodes and three antinodes spaced along said axis, one of said antinodes being located at each of said ends of said implement, and

a cantilevered vibration damper comprising an elongated resilient member having a longitudinal axis, said member having one end attached to said implement at the location of one of said antinodes, with the longitudinal axis of said member generally parallel to the longitudinal axis of said implement, the opposite end of said member being free to vibrate, said member being formed of an energy-absorbing material and being so configured and dimensioned that its natural frequency of vibration corresponds to the frequency induced in the implement during said vibration, whereby said vibration is significantly damped.

3,941,381
BOARD GAME AMUSEMENT DEVICE

Nicholas D. Trbovich, 28 Tanglewood Drive West, Orchard Park, N.Y. 14127

Filed Aug. 7, 1974, Ser. No. 495,514
Int. Cl.² A63F *7/06, 7/14*
U.S. Cl. 273—85 R **7 Claims**

1. An amusement game apparatus comprising:

a. means defining a playing surface;

b. a plurality of indicia-bearing elements adapted to be placed on said playing surface selectively at different times thereby defining selected playing surfaces for a corresponding plurality of different types of games;

c. a player element movably connected to said playing surface and extending from said surface and the indicia-bearing element placed thereon, said player element including means operable by a person playing the game for moving said player element along a portion of said playing surface;

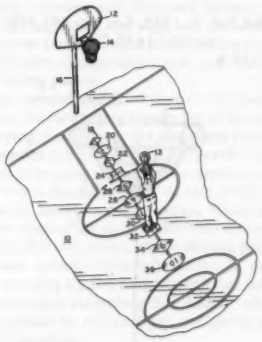
d. a player piece adapted for free movement onto and along said playing surface and the indicia-bearing element thereon; and

e. means for guiding and deflecting said player piece moved by a person playing the game toward and onto said playing surface and the indicia-bearing element thereon, said means for guiding and deflecting said player piece comprises a guide surface vertically spaced from said playing surface and means defining and deflecting surface positioned between said guide surface and said playing surface, and deflecting surface being shaped in a manner such that said player element moving along said guide surface and onto said deflecting surface is directed by said deflecting surface onto said playing surface, said deflecting surface being curvilinear in transverse cross section and the curvilinear arc portions thereof lying in planes substantially perpendicular to the longitudinal axis of said deflecting surface and located in the mid longitudinal axial portion of said deflecting surface being of shorter angular extent than at other portions along the longitudinal axis of said deflecting surface, whereby the movement of the player piece along said playing surface and the indicia-bearing element thereon is influenced by the movement thereof along said guiding and deflecting means and by operation of said player element, the nature of the movement of the player piece along said playing surface and indicia-bearing element affecting the outcome of the game.

3,941,382
BASKETBALL GAME

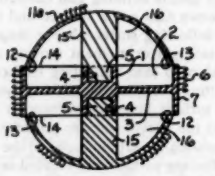
Robert T. Clark, 5140 Stonehedge Blvd., Fort Wayne, Ind. 46815

Filed Aug. 9, 1973, Ser. No. 386,951
Int. Cl.² A63B *71/02*
U.S. Cl. 273—95 R **1 Claim**



1. A basketball game intended for use with a basketball playing floor and backboard on which a basket is mounted, comprising a plurality of numerically identified marking elements of different sizes and shapes, and each bearing a different numerical value thereon, said marking elements each having a slot one at each of opposite ends thereof, and a plurality of flexible elongated rectangular strips each having a smooth non-abrading outer surface and each including notched ends proportioned to be received one within a respective slot of adjacent marking elements to locate successive adjacent elements relative to each other, said elements being individually moveable and moveable together about the playing area in relation to the basket to designate locations from which a player makes a shot and providing a scoring value when the shot is successful according to the marking element at the spot at which the basket is made.

3,941,383
VELCRO PROJECTILE AND TARGET
William A. Clarke, 1001 Linden Ave., Erie, Pa. 16505
Filed Dec. 2, 1974, Ser. No. 528,675
Int. Cl.² A63B 71/02
U.S. Cl. 273—95 R 11 Claims

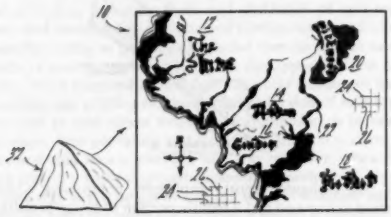


1. A game comprising a ball projectile having two intersecting wheel elements assembled at right angles to each other and coacting to form a ball, each wheel element having a rim with a cylindrical outer surface coated with a tread of burr material, the axes of the cylindrical surfaces intersecting each other at right angles, each wheel element having a recess extending inward from its periphery, the recess in one wheel element extending in a direction opposite the direction in which the recess in the other wheel element extends, and a target against which the projectile is to be propelled, said target being of material to which the burr material adheres upon contact so a burr coated surface of the projectile is adhered to the target at the point at which the surface strikes the target.

3,941,384
BALLOON CARRIED BASKET FOR BALL GAME
Paul R. Wopschall, 3248 Carlsbad Blvd., Carlsbad, Calif. 92008
Filed Feb. 7, 1975, Ser. No. 547,810
Int. Cl.² A63B 71/02
U.S. Cl. 273—105 R 2 Claims

1. Equipment for playing hoop ball comprising:
a balloon having a wall of toroidal shape and having a central circular opening of great enough diameter for passage of a ball through it, said wall being hollow and filled with a gas lighter than air;
a basket having a circular upper edge attached around a circular part of the balloon encompassing the circular opening, said basket being sufficiently closed at its bottom to hold the ball;
tether means attached to the equipment; and
means attaching said tether means to a base at a position beneath the center of the basket.

3,941,385
GAME
John J. Lalley, 465 E. Washington St., Ionia, Mich. 48846
Continuation of Ser. No. 278,575, Aug. 7, 1972, abandoned.
This application June 25, 1974, Ser. No. 483,029
Int. Cl.² A63F 3/04
U.S. Cl. 273—131 BB 7 Claims

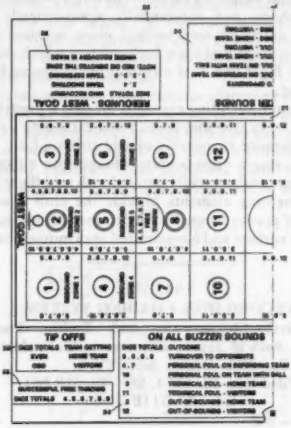


1. In combination, a game apparatus consisting of:
a game board having means depicting a geographical area including first and second irregular, non-symmetrical, non-mirror image geographical sections and means defining a boundary between said sections,
means defining a plurality of generally uniformly distributed pawn positions on said geographical area, a predetermined number of pawns located on said pawn positions, said predetermined number of pawns consisting of a first plurality of pawns each having indicia means on the side walls thereof representative of a power of between 1 and 10 and oriented on selected pawn positions on said first geographical section such that said indicia faces away from said second geographical area, a second plurality of pawns equal in number to said first plurality with each having indicia means on the side walls thereof representative of a power of between 1 and 10 and oriented on selective pawn positions on said second geographical section such that said indicia faces away from said first geographical section, and a pawn having an indicia of 0 located on one of said first and second geographical sections, and
a movable marker located on the other of said geographical sections and defining an objective piece for said last mentioned pawn.

3,941,386
BASKETBALL BOARD GAME APPARATUS
John H. Nelson, P.O. Box 800, Santa Cruz, Calif. 95061
Filed Sept. 19, 1974, Ser. No. 507,475
Int. Cl.² A63F 3/00
U.S. Cl. 273—131 C 2 Claims

1. A game board having a playing area divided into a plurality of longitudinally and transversely aligned rows of zones, a playing piece adapted to be advanced from zone to zone in a generally longitudinal direction, the center transverse row of zones being unidentified by numerals, zones on either side of said central row being individually identified by number; control means associated with said zone numbering system whereby a limited combination of said zone-identifying numbers can be set to permit a continuance of movement of said

playing piece from zone to zone, along one or more of a number of paths, while blocking movement along others, all



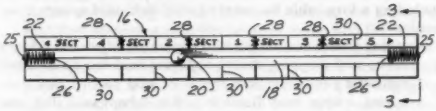
of said zones, except the centrally located starting zone, being marked with a series of probability numbers.

3,941,387

RACE GAME APPARATUS

Anthony Mooradian, 10825 Silicon Ave., Pomona, Calif. 91766

Filed Dec. 13, 1974, Ser. No. 532,413
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—134 B **5 Claims**



1. Game apparatus comprising:

a replica of a racecourse having a starting point and a finish point, said course being divided into a sequence of stations;

a plurality of markers representing a plurality of players contesting in a race over said course, said markers being distinguished from each other in appearance to correspond to the different players of the game, and being movable through the sequence of stations; and

means operable by each player in turn to determine the number of stations through which the player is to advance his marker along said course;

said determining means comprising:

a guideway divided into sections to determine the advance of a marker from station to station along the racecourse, said guideway comprising an elongate member with a longitudinal groove of V-shaped cross section therein;

a ball freely movable in said longitudinal groove by impetus manually imparted thereto by a player; and

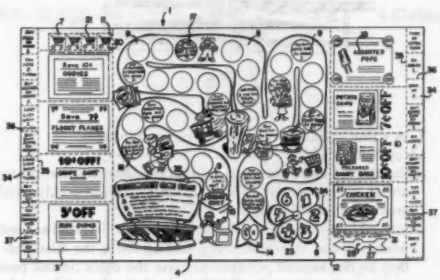
metal spring means secured to said elongate member at each end of said longitudinal groove for impact by said ball to reverse the direction of movement of the ball by recoil action.

3,941,388

GAME AND NEWSPAPER SUPPLEMENT

Theodore N. Isaac, and Nancy Ingles, both of Shawnee Mission, Kans., assignors to Consumers Communication Corporation, Shawnee Mission, Kans.

Filed Oct. 7, 1974, Ser. No. 512,737
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—134 G **1 Claim**



1. A combined advertising insert and game with redeemable coupons for insertion as an advertising supplement between parts of a newspaper and the like comprising:

a. a generally rectangular sheet of paper having side and end edges;

b. said sheet having first and second lines spaced apart and spaced from and parallel to respective end edges of said sheet, said sheet having a plurality of spaced third lines extending between said first and second lines and between the respective end edge and the adjacent first and second lines and defining a plurality of separable coupons and a plurality of separable cards and a plurality of separable playing pieces;

c. said first, second and third lines on the sheet are lines of weakness for facilitating separation of the coupons, cards and playing pieces from the sheet and from each other;

d. said coupons having indicia thereon referring to different products to represent same in the game and indicia referring to terms for redemption of said coupons;

e. said cards having various indicia thereon referring to products indentified on the different coupons and giving directions for movement of the playing pieces;

f. said sheet having imprinted thereon a game area and indicia defining a game path divided into successive game spots positioned therealong and indicia referring to products identified on the coupons and giving playing pieces moving directions;

g. said coupons are positioned adjacent the game area and the cards and playing pieces are between the coupons and a respective end edge of the sheet whereby the coupons may remain attached after removal of the cards and playing pieces, said coupons remaining attached serve as identification and association with product indicia on the game area until removed for redemption;

h. said playing pieces when separated being movable from game spot to game spot along said path;

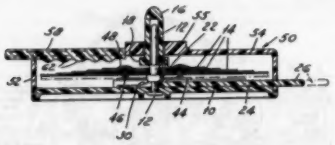
i. a plurality of numbers on said sheet in a circle about a center point, said numbers being circumferentially spaced apart; and

j. an indicator integral with said sheet and separable therefrom for rotatable mounting above said sheet adjacent said numbers wherein the number indicated by the indicator after rotation is the number of game spots to be moved by a said playing piece along said game path.

3,941,389
SPINNER GAME DEVICE

Charles W. Guimond, 1826 Norwood Drive, Grosse Pointe Woods, Mich. 48236

Filed May 30, 1975, Ser. No. 582,345
Int. Cl.² A63F 5/04
U.S. Cl. 273—142 HA **15 Claims**

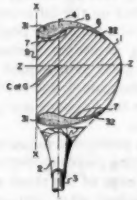


1. A game apparatus including, in combination:
an upright post;
a plurality of discs mounted on said post for rotation thereabout independently of one another and for bodily axial movement therealong;
a control member means movable between first and second positions and operable when moved from the first position to the second position to raise the discs on the post as a group to a higher level and when moved from the second position to the first position to cause the discs to descend on the post to a lower level;
a spinner member rotatably mounted upon the post above the discs, said spinner member having means providing a one-way driving connection with the discs and being operable upon rotary movement in one direction to impart rotation to the discs, said driving connection being operable to free the discs for individual rotation movement when the discs overrun the driving connection, and
stop means engageable with the discs when the same have assumed their lower level to stop the rotation of the discs.

3,941,390
HEEL AND TOE WEIGHTED GOLF CLUB HEAD

Douglas Hussey, 47 Woodridge Cres., Apt. 13, Ottawa, Ontario K2B 7T2, Canada

Continuation-in-part of Ser. No. 83,501, Oct. 23, 1970, abandoned. This application Apr. 26, 1972, Ser. No. 247,760
Claims priority, application Canada, May 3, 1971, 112016
Int. Cl.² A63B 53/04
U.S. Cl. 273—169 **16 Claims**

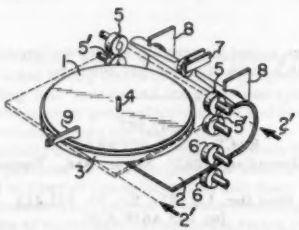


1. A golf club head comprising:
a. a main body portion of a parent material of predetermined density having shaft attachment means for the attachment of a shaft thereto;
b. said main body portion having a front striking face, a rear surface, a sole surface, a top surface and toe and heel portions;
c. said heel and toe portions defining peripheral side portions of said main body portion;
d. a plurality of weighting elements having an outer and inner surface with said outer surface located adjacent to and forming a part at least of said peripheral side portions and blended therewith, said inner surface following generally the contour of said outer surface;
e. each of said weighting elements being of a material having a density greater than said parent material;
f. each of said weighting elements having a similar predetermined shape and substantially symmetrically located about a predetermined vertical plane substantially centrally located in said main body portion which defines the intended flight line, said elements being spaced from said flight line;
g. each of said weighting elements located a predetermined distance from said sole surface and extending a predetermined distance rearwardly of said striking face; said elements having a cross-section wherein the major dimension extends substantially parallel with said flight line and
h. said weighting elements provide the club head with a center of gravity located a predetermined distance above said sole surface and a maximized area moment of inertia.

3,941,391
RECORD DISK LOADING SYSTEM

Shoji Ohmiya, Shijonawate, and Toshio Yoshimatsu, Neyagawa, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 29, 1974, Ser. No. 518,881
Int. Cl.² G11B 25/04
U.S. Cl. 274—9 B **4 Claims**



1. A system for loading a record disk contained within a flexible jacket into a recording and reproducing apparatus including a turn table for rotating said disk, said system comprising
stopping means secured to said apparatus adjacent said turn table, said stopping means engaging said record disk and restricting only the movement of said record disk contained within said flexible jacket when said disk and flexible jacket are loaded on said turn table, and
thrust means secured to said apparatus adjacent said turn table for transferring said flexible jacket to an interim position under said turn table, said jacket being bent in said interim position and while being transferred thereto.

3,941,392
RECORD PLAYER

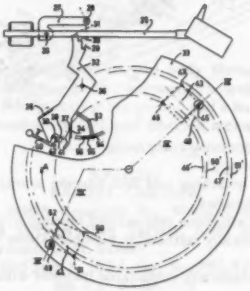
Jozef-Antoon Grosemans; Piet vander Lely, and Willem Hendrik Stigter, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 26, 1974, Ser. No. 509,480
Claims priority, application Netherlands, Oct. 1, 1973, 7313450
Int. Cl.² G11B 17/06, 3/60
U.S. Cl. 274—10 R **8 Claims**

1. An apparatus for automatically controlling the pick-up arm set-down diameter in a record player comprising a turntable having a surface on which a record may be placed and an axis perpendicular to said surface about which axis the turntable is rotatable; at least one sensing pin so connected to the turntable as to be disposed in a raised position projecting above said surface in the absence of a record, having a diameter less than a first given diameter, on the turntable, and in a depressed position in response to placement of a record

greater than said given diameter on the turntable; a tone-arm assembly, comprising a tone-arm, means for mounting the tone-arm for pivotal motion about an axis parallel to the turntable axis, and a stop bracket for limiting pivoting of the arm toward the axis of the turntable; and abutment means for engaging said stop bracket at one of a plurality of bracket positions to limit said pivoting, each bracket position corresponding to a set-down diameter of the tone-arm corresponding to a pin position, wherein

said abutment means comprises an abutment plate movable between at least a first locked position and a second locked position closer to said turntable axis than said first locked position, each locked position corresponding to a set-down diameter, said abutment plate comprisng at least first and second abutment members; and



said apparatus further comprises means responsive to the position of said sensing pin for engaging at least one of said abutment members when the abutment plate position corresponds to a set-down diameter different from that corresponding to the sensing pin position, and for moving said abutment plate toward the locked position corresponding to that pin position, said position responsive means comprising a first abutment element for engaging said first abutment member so as to move said first member toward the turntable axis thereby moving said abutment plate from said first position toward said second position, and a second abutment element for engaging said second abutment member so as to move said second member away from the turntable axis thereby moving said plate from said second plate position toward said first position; and means for releasably locking said abutment plate in each locked position.

3,941,393

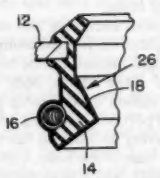
SEAL METHOD AND ARTICLE

Dean R. Bainard, Bethel Township, S.C., assignor to Garlock Inc., Palmyra, N.Y.

Filed Mar. 15, 1974, Ser. No. 451,447

Int. Cl.[2] F16J *15/32*

U.S. Cl. 277—9.5 **9 Claims**



1. A seal having a flexible sealing element and a spring installed thereon, and a unitary and integral film of wax covering a sufficient portion of both said spring and said sealing element for retaining said spring on said sealing element during shipping, handling, and installation of said seal.

3,941,394

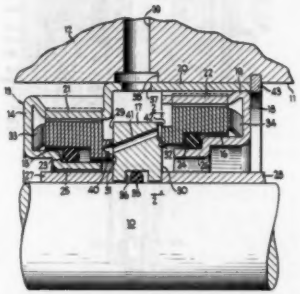
NO-LEAK DOUBLE ROTARY MECHANICAL SEAL

Donald J. Lukes, Palatine, Ill., assignor to Crane Packing Company, Morton Grove, Ill.

Filed Dec. 9, 1974, Ser. No. 531,082

Int. Cl.[2] F16J *9/00, 15/40*

U.S. Cl. 277—40 **4 Claims**



1. A rotary mechanical seal for preventing leakage of fluid under pressure along a shaft or the like, said seal comprising a rigid rotating mating ring having substantially parallel flat sealing surfaces on opposite sides thereof, inboard and outboard primary sealing rings each having a sealing surface in contact with one of the rotating mating ring sealing surfaces, a housing having a bore in which said rotating mating ring and inboard and outboard primary sealing rings are disposed, means fixing said inboard and outboard primary sealing rings against rotation relative to the housing, means sealing said primary sealing rings flexibly to said fixing means, resilient means holding said inboard and outboard primary sealing rings against the flat sealing surfaces of the rotating mating ring, said inboard primary ring sealing surface having a groove therein to collect leakage of fluid across said inboard primary ring sealing surface, said rotating mating ring having a plurality of holes disposed with their axes radially inclined with respect to the axis of said mating ring, the radially inner ends of said holes being in communication with the groove in the inboard primary ring sealing surface, and the radially outer ends of said holes being in communication with the sealing surface on the outboard primary ring, means on the rotating mating ring for inducing radially outward movement of the fluid in the radially outer ends of the rotating mating ring, and means for conducting fluid from around the rotating mating ring to a sump.

3,941,395

COOLED SEAL CARTRIDGE

Rowland E. Ball, Long Beach, and Winfred J. Wiese, Whittier, both of Calif., assignors to Borg-Warner Corporation, Chicago, Ill.

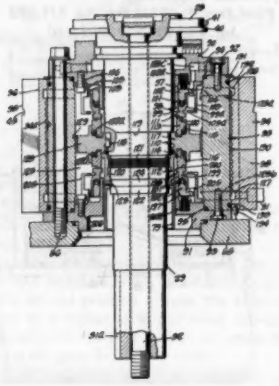
Division of Ser. No. 338,807, March 8, 1973, Pat. No. 3,884,482. This application Dec. 30, 1974, Ser. No. 537,169

Int. Cl.[2] F16J *9/00*

U.S. Cl. 277—41 **5 Claims**

1. A mechanical seal cartridge comprising: a rotatable stub shaft adapted to be connected at one end to a rotating shaft and at the other end to a rotatable shaft, a hollow housing adapted to be connected between spaced housings and the like and disposed about said stub shaft, said housing having an opening for access to said cartridge whereby said cartridge can be replaced as a unit in said housing, end flanges disposed

about said stub shaft, means releasably connecting said end flanges to said housing, each of said end flanges carrying non-rotatable sealing ring means including an axially shiftable seal ring having a radial seal face, the radial seal face of the respective seal rings being disposed in opposing axially spaced relation, rotatable sealing rings means carried by said stub



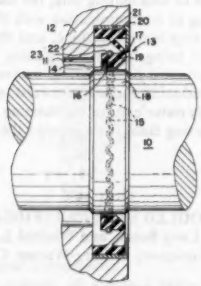
shaft for rotation therewith and providing oppositely facing radial seal faces for engagement by said radial seal faces of the respective axially shiftable seal rings, and spring means interposed between said end flanges and said axially shiftable seal rings for biasing the latter towards said rotatable sealing ring means to effect said engagement of said radial seal faces.

3,941,396

SEAL FOR ROTATING MEANS

John M. Bailey, Dunlap, and Michael K. Stratton, Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 15, 1974, Ser. No. 497,657
Int. Cl.² F16J 15/40
U.S. Cl. 277—134 **15 Claims**



1. A seal assembly for sealing between inner and outer concentrically mounted relative rotatable members, comprising in combination:

inner and outer annular seal members having radially directed sealing faces disposed in sealing engagement and mounted for relative rotation therebetween; and,

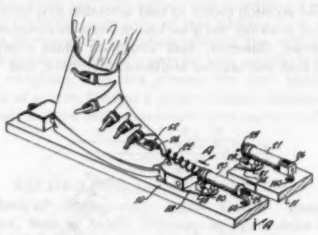
one of said annular seal members comprising convoluted radially resilient metallic ring means for biasing said seal faces into sealing engagement.

3,941,397

SKI DEVICE

Richard A. Kidder, 406 D. W. Nobel Ave., Santa Ana, Calif. 92707; Henry H. Nakasone, 1672 Camrose Way, Anaheim, Calif. 92802, and Bruce D. Jimerson, 2131 Grenadier Drive, San Pedro, Calif. 90732

Filed June 17, 1974, Ser. No. 479,665
Int. Cl.² A63C 11/02, 9/00
U.S. Cl. 280—11.35 N **16 Claims**



1. A ski accessory comprising:

a first housing;

means for attaching said first housing to one ski;

a second housing;

means for attaching said second housing to the other ski;

a first elastically retractable member within said first housing;

a second elastically retractable member within said second housing;

runaway ski prevention means for temporarily attaching one end of each said first and second elastically retractable members to the skier so as to prevent ski runaway, said runaway ski prevention means comprising a first safety clip attached to said first elastically retractable member and a second safety clip attached to said second elastically retractable member and a first receiver attached to the skier for retaining said first safety clip and a second receiver attached to the skier for retaining said second safety clip;

means for locking said first and second elastically retractable members together about a ski rack so as to prevent the unauthorized removal of the skis.

3,941,398

GOLF CLUB HOLDER

Karl M. Nelson, Box 182, Jewell, Iowa 50130

Filed Aug. 5, 1974, Ser. No. 494,634
Int. Cl.² A63C 55/08
U.S. Cl. 280—47.19 **5 Claims**

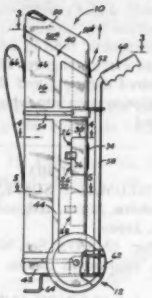
5. Apparatus for transporting golf clubs comprising

an elongate body of rigid foamed plastic material, said body having multiple elongate bores defined therein extending longitudinally of the body and separated laterally from one another by partition portions of said body contributing rigidity thereto, said bores having top ends which open to the top of said body and being adapted to receive the shafts of golf clubs.

multiple strap portions encircling and snugly encompassing said body at regions distributed along the length of said body with the rigid foamed plastic material of said body maintaining the shape of the body and thus the snug encompassing relation of said strap portions about said body, said strap portions including one adjacent the base of said body having an integral floor portion which extends under the base of the body, a strap portion adjacent the top of the body, and a strap portion intermediate the first and second-mentioned strap portions,

a cover hinged to the strap portion adjacent the top of said body swingable to a position overlying the top of said

body with the cover defining a chamber between it and the top of the body for receiving the heads of clubs, and

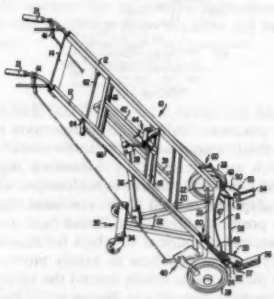


wheeled means secured to said body through said strap portions including ground-supporting wheels adapting the body for transport over the ground and a handle provided for the manipulation of said wheeled means.

3,941,399
BARREL CARRIER

Jack Peters, 24008 Bessemer St., Woodlands Hills, Calif. 91364, and DeLoris Joan Barrett, 6206 Satsuma Ave., North Hollywood, Calif. 91606

Filed July 8, 1974, Ser. No. 486,942
Int. Cl.² B62D *1/14*
U.S. Cl. 280—47.29 **14 Claims**

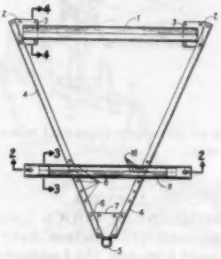


1. A hand truck comprising:
an elongate frame;
an axle and wheels assembly affixed to one end of said frame for rolling the truck on a support surface;
at least one load supporting shoe having a flat lower surface below the level of said axle when the hand truck is in a vertical position, each said shoe having a forward toe portion and a rearward heel portion,
means connecting said shoe to said frame,
said shoe being pivotally supported on said connecting means, said connecting means defining a continuously curved surface extending from the heel of said shoe rearwardly in a direction toward said axle to permit rocking of said hand truck about pivot points progressively moving along said curved surface as said hand truck pivots between a position in which said lower surface of the shoe is in contact with the support surface and a position in which said wheels contact said support surface,
whereby no discontinuity is required in the forces required to be exerted on said frame to rock said hand truck forwardly or rearwardly between said vertical position and a rearwardly tilted position in which a load on said at least one shoe is fully supported on said wheels.

3,941,400
PLOW DOLLY

Peter Buttner, 92 Sunset Road, Weston, Mass. 02193

Filed Sept. 20, 1974, Ser. No. 507,888
Int. Cl.² B62B *5/00*
U.S. Cl. 280—79.1 **4 Claims**



1. A dolly for connection and disconnection of a utility attachment to and from a vehicle having vertically adjustable lift bracket means, the utility attachment having a yoke with mutually spaced means for connection to the bracket means and blade means spaced from and attached to the yoke, the blade means extending laterally across a perpendicular bisector of a line between said means for connection, said dolly having
a self-supported, wheeled frame having a pair of side rails, a blade support member connecting the side rails and yoke support means secured to each of the side rails in spaced relation to the blade support member,
a plurality of mutually spaced wheel means on the frame substantially supporting the blade support member and at least one additional wheel means on the frame substantially supporting the yoke support means,
and a pair of mutually spaced yoke lift means on the yoke support means, each engageable with and in lifting relation to a portion of the yoke and vertically adjustable manually and independently of the other yoke lift means to vary the height of one of said mutually spaced means for connection relative to the lift bracket means.

3,941,401
INDEPENDENT WHEEL SUSPENSION HAVING SUSPENSION STRUT

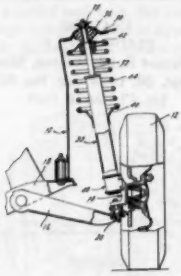
William D. Allison, Grosse Pointe Farms, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 23, 1974, Ser. No. 535,539
Int. Cl.² B62D *17/00*
U.S. Cl. 280—96.2 B **11 Claims**

1. An independent wheel suspension for a motor vehicle comprising vehicle body structure, a wheel support member, and suspension means interconnecting said body structure and said wheel support member,
said suspension means including an extensible suspension strut having one end connected to said body structure,
connecting means connecting the other end of said strut to said wheel support member,
the camber and caster alignment of said wheel support member being determined in part by said strut,
said connecting means including an elastomeric member operatively interposed between said wheel support mem-

ber and said strut,

said elastomeric member being constructed to attenuate the transmission of vibrations from said wheel support member to said strut.



3,941,402

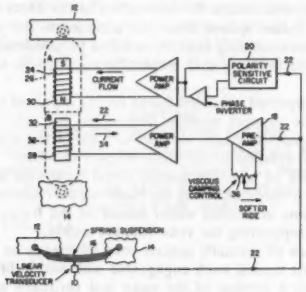
ELECTROMAGNETIC SHOCK ABSORBER

Anthony P. Yankowski, 117 Brighton Ave., Belleville, N.J. 07109, and Arnold Klausner, 151 Luddington Ave., Clifton, N.J. 07011

Filed Mar. 3, 1975, Ser. No. 554,461

Int. Cl.² B60G *11/00*

U.S. Cl. 280—124 R 5 Claims



1. An electromagnetic shock absorbing system, intended to maintain the sprung and unsprung elements of a mechanical system at a fixed distance from each other, comprising:

a. a linear velocity transducer medially coupled between said sprung and unsprung elements, said transducer serving to convey A current flow proportional in magnitude to the velocity of relative motion between said sprung and unsprung elements and, further, having a direction of flow which is a function of the direction of relative movement between said sprung and unsprung elements;

b. a first electromagnet having a polarity which, regardless of the direction of its input current from said transducer, is arbitrarily maintained in a single direction, said first electromagnet being longitudinally disposed between said sprung and unsprung elements; and

c. a second electromagnet, electrically coupled to the output of said transducer, having a polarity which is directly proportional to the direction of relative movement between said sprung and unsprung elements, said second electromagnet longitudinally disposed between said elements and, further, disposed upon the same longitudinal axis as said first electromagnet,

whereby said second electromagnet will, under conditions in which said sprung and unsprung elements are moving apart, experience a direction of current flow about it which will produce an electromagnetic field which will attract the adjacent poles of said first and second electromagnets to each other, and, conversely, under conditions in which said sprung and unsprung elements are moving toward each other will produce an electromagnetic field in which adjacent poles of said first and second electromagnets will repulse each other, thus creating a desired damping and shock absorbing effect within any suspension system into which the present system may be incorporated.

3,941,403

HYDRO-PNEUMATIC SUSPENSION UNIT

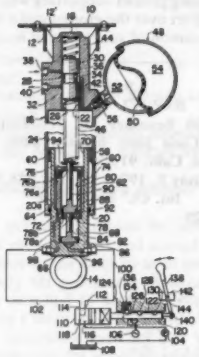
Mituo Hiruma, Kodaira, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Mar. 13, 1975, Ser. No. 557,947

Claims priority, application Japan, Mar. 19, 1974, 49-30564

Int. Cl.² B60G *15/00*

U.S. Cl. 280—124 F 7 Claims



1. A hydro-pneumatic self-levelling suspension unit for an automotive vehicle comprising first and second cylindrical members which are telescopically connected together and which are axially movable relative to each other, self-levelling valve means disposed in said first cylindrical member and having a first position operative to direct fluid pressure into the first and second cylindrical members for causing the first and second cylindrical members to axially move relative to each other in directions to axially extend the suspension unit and a second position operative to discharge the fluid pressure from the first and second cylindrical members for causing the first and second cylindrical members to axially move relative to each other in directions to axially contract the suspension unit, resilient biasing means disposed in the first cylindrical member and engaging said valve means for biasing the valve means toward an equilibrium position between said first and second positions of the valve means thereby holding the suspension unit in a balanced condition, hydro-pneumatic spring means operative to compensate for fluctuations in the fluid pressure in said first cylindrical member, valve actuating means disposed in said second cylindrical member and engaging said resilient biasing means, said valve actuating means being stepwise extensible in an axial direction of said cylindrical member between a fully contracted length and a fully extended length for actuating said valve means through said resilient biasing means into said first position responsive to extension of said valve actuating means and into said second position responsive to contraction of the valve actuating means, said valve actuating means being biased toward said fully contracted length partly by said resilient biasing means and partly by the fluid pressure in the first and second cylindrical members, fluid supply means having a plurality of opera-

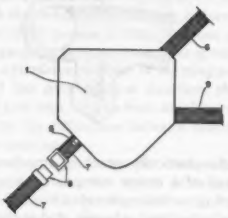
tive positions for supply working fluid to the valve actuating means and causing the valve actuating means to be selectively stepwise extended or contracted between said fully contracted length and said fully extended length, and manually-operated control means for manually actuating the fluid supply means selectively into any of said operative positions thereof.

3,941,404

PROTECTOR FOR VEHICLE OCCUPANT

Jose Maria Otaegui-Ugarte, Barrio de Alcibar, Oyarzun, Guipuzcoa, Spain

Filed Feb. 25, 1975, Ser. No. 553,040
Int. Cl.² B60R 21/08
U.S. Cl. 280—150 AB 3 Claims



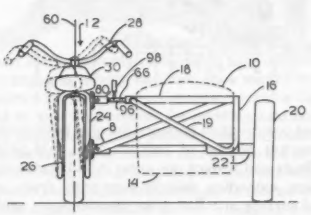
1. A chest protector for a vehicle occupant comprising a substantially flat, hollow air chamber shaped to conform to the thorax and abdomen of the occupant, said chamber having a metal mesh interior lining and a fiber-reinforced exterior covering; an air valve on said chamber establishing selective communication with the interior of the chamber for supplying pressurized air thereto; and seat belts to which said air chamber is rigidly secured for protective disposition against the lower chest and abdomen when the belts are buckled about the occupant.

3,941,405

ADJUSTABLE MOTORCYCLE SIDECAR MOUNTING APPARATUS

Craig W. Vetter, Rantoul, Ill., assignor to Vetter Design Works, Inc., Rantoul, Ill.

Continuation-in-part of Ser. No. 499,969, Aug. 22, 1974. This application Nov. 4, 1974, Ser. No. 520,643
Int. Cl.² B62K 27/12
U.S. Cl. 280—203 19 Claims



1. Apparatus for mounting a sidecar to a motorcycle and to adjustably vary during transit the lean from vertical of the motorcycle, comprising in combination:

means for securing the sidecar to the motorcycle for pivotal motion about an axis substantially parallel to the direction of travel of the motorcycle and sidecar; and

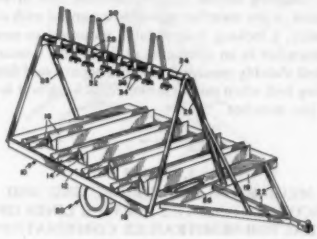
an elongate member secured to both the motorcycle and the sidecar at respective locations substantially spaced vertically from the axis of said pivotal securing means, and adjustable in length when secured to the sidecar and the motorcycle for selectively varying the pivotal position of the motorcycle relative to the sidecar, said elongate adjustable member being rigid and comprising the only rigid means other than said pivotal securing means for mounting the sidecar to the motorcycle.

3,941,406

BICYCLE CARRYING RACK

David M. Eggleston, 5732 Mary Lane Drive, San Diego, Calif. 92115

Filed Dec. 9, 1974, Ser. No. 531,039
Int. Cl.² B60P 3/06
U.S. Cl. 280—400 8 Claims



1. A rack for carrying at least one bicycle or the like comprising:

a. a base member defining a plurality of upwardly open elongated parallel troughs each dimensioned to seat the wheels of a bicycle placed in longitudinal alignment therein, and said troughs being vertically staggered to prevent interference of the handlebars of adjacent bicycles carried in said rack;

b. a plurality of clamp elements and means mounting same to said base member in spaced relation above said trough;

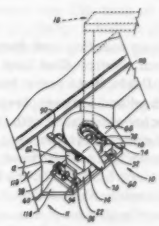
c. each of said clamp elements being staggered relative to adjacent clamp elements and capable of securely and releasibly engaging a structural member of a bicycle resting in a respective one of said troughs.

3,941,407

FIFTH WHEEL TRAILER HITCH

Glenn H. Breford, Holyrood, Kans., assignor to Midway Industries, Inc., Holyrood, Kans.

Continuation-in-part of Ser. No. 379,713, July 16, 1973, Pat. No. 3,848,894. This application Nov. 18, 1974, Ser. No. 524,381
Int. Cl.² B62D 53/08
U.S. Cl. 280—415 A 6 Claims



1. A fifth wheel type trailer hitch, comprising:

a. a mount means having a mounting plate rigidly mountable on a supporting structure and a pair of spaced upright end portions, said mounting plate having means to removably mount said upright end portions, and said upright end portions each having in the upper portion

thereof a pair of oppositely extending lugs on a lower portion thereof to pivotally receive and mount a shaft, said means to removably mount said upright end portions has a socket and guide means to receive and hold said lugs in a mounted relation,

b. a cross member having a shaft mounting means in opposite portions thereof and having a shaft mounted in said shaft mounting means and extending from said cross member, said shaft being mounted in said means to pivotally receive and mount a shaft,

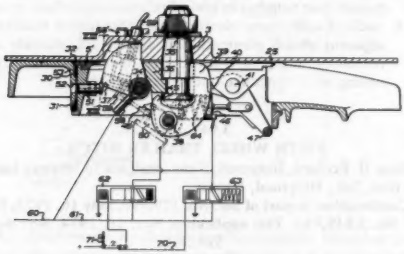
c. coupling means mounted on the upper side of said cross member and constructed and adapted to receive and mount in towing relation a cooperative coupling means on a trailer or the like, and

d. said coupling means has an entrance slot in said cross member, a jaw member movably mounted with said cross member, a locking bolt slidably mounted to secure said jaw member in an operating position and a second locking bolt slidably mounted to in use secure said first named locking bolt when said first named locking bolt is securing said jaw member.

3,941,408
MECHANISM FOR CONNECTING AND DISCONNECTING THE SERVICE LINES OF A TRACTOR-SEMITRAILER COMBINATION

Ralf Krister Ebbe Petersson, Alsterbro, Sweden, assignor to Kalmar Verkstads AB, Kalmar, Sweden

Filed Mar. 5, 1974, Ser. No. 448,319
Claims priority, application Sweden, Mar. 6, 1973, 7303106
Int. Cl. B60d *1/08*
U.S. Cl. 280—421 **25 Claims**

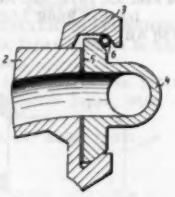


1. A mechanism for connecting and disconnecting service lines, such as electrical service lines and service lines for pressurized operating fluids, between a tractor and a semitrailer having a fifth wheel and king pin, respectively, comprising at least one connector associated with the service lines of the semi-trailer at a distance from the king pin center and at least one connector associated with the service lines of the tractor at the same distance from the fifth wheel center for the king pin, each of said connectors mounted on the respective vehicle units with one of said connectors mounted for movement about the respective center whereby the connector is reciprocably movable along a circular path about the common geometrical axis of the aligned king pin and fifth wheel centers, operating means on one of said vehicle units for moving a respective one of said connectors relative to the other to connect said connectors together whereby after mechanical coupling of the vehicle units said units may articulate with retained engagement between the two connectors.

3,941,409
METHOD AND APPARATUS FOR ATTACHING THE EXHAUST MANIFOLD

Jean Rameau, Robert-Sannois, France, assignor to Regie Nationale des Usines Renault, Billancourt and Automobiles Peugeot, Paris, both of, France

Filed Jan. 24, 1974, Ser. No. 436,032
Claims priority, application France, Feb. 16, 1973, 73.05613
Int. Cl.² F16L *39/00, 51/00;* B23P *15/00*
U.S. Cl. 285—137 R **5 Claims**



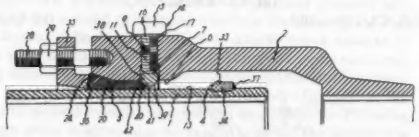
1. Apparatus for elastically attaching an exhaust manifold to the cylinder head of a motor comprising: upper and lower, inclined supporting surfaces provided on said exhaust manifold and said cylinder head wherein said inclined supporting surfaces are in facing relationship and said surfaces of both said manifold and head are defined within transversely disposed planes, and

elastic means disposed between either said upper or lower inclined supporting surfaces provided on said exhaust manifold and said cylinder head for pressing said exhaust manifold against its gasketed mating surface with said cylinder head and wedging said other exhaust manifold surfaces into contact against said other cylinder head surfaces.

3,941,410
PIPE JOINT CONSTRUCTION

Tadashi Miyaoka, 7-31, Horikiri-cho, Nishinomiya, Hyogo, Japan

Filed Oct. 10, 1974, Ser. No. 513,569
Int. Cl.² F16L *21/04*
U.S. Cl. 285—321 **4 Claims**



1. A joint construction between the plug portion of one pipe and the socket portion of another pipe, said plug portion having a front end surface, an outer cylindrical surface and a step surface extending radially outwardly from said outer cylindrical surface at a first axial distance from said end surface;

said step surface of the plug portion being provided by a projecting ring having its inner peripheral portion fitted in an annular groove circumferentially formed in the outer cylindrical surface of the plug portion, said projecting ring being welded to the outer cylindrical surface of the plug portion only at the side facing said end surface, the lateral surface of said projecting ring at the non-welded side serving as said step surface of the plug portion;

said socket portion having an axially inner end surface opposed to said front end surface of the plug portion, an

annular groove formed circumferentially in the inner peripheral surface of said socket portion;

a split lock ring fitted in said annular groove and having an inner lateral surface opposed to said step surface, said inner lateral surface being spaced axially from said inner end surface of the socket portion by a second axial distance which is greater than said first axial distance, and said inner lateral surface being inclined so as to have a radially inward wedging action on said projecting ring;

a plurality of circumferentially spaced threaded opening extending radially between the bottom of said annular groove and the outer peripheral surface of the socket portion;

screw means engaged in said threaded openings to urge said lock ring against the elasticity thereof toward the pipe axis and decrease the lock ring diameter, the arrangement being such that when said lock ring is decreased in diameter by said screw means so that the inner periphery of the lock ring projects from said annular groove and engages said outer cylindrical surface of the plug portion, said step surface of the plug portion overlaps the inner lateral surface of said lock ring to limit axial movement between the pipes by the difference between said second and first axial distances; and,

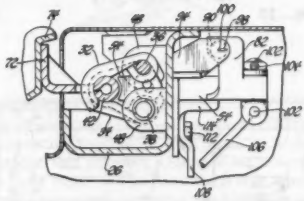
a sealing member, and means for compressing the sealing member into an annular space bounded by the inner surface of the socket portion, the outer lateral surface of the lock ring and the outer cylindrical surface of the plug portion.

3,941,411

DOOR LOCK ASSEMBLY

William L. Pringle, Grosse Pointe Shores, Mich., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Oct. 29, 1974, Ser. No. 518,259
Int. Cl.² E05C 9/16
U.S. Cl. 292—26 **29 Claims**



1. A door latch assembly comprising: support means; latch means for engaging a latch bar, said latch means being pivotally supported by said support means; movable link means connected to said latch means for pivoting said latch means alternately toward a latched position and an unlatched position; a release lever for actuating said link means to pivot said latch means toward the unlatched position; and release lever support means for movably supporting said release lever about at least two angularly related axes in engaging proximity to said link means such that said release lever is movable about each said axis to effect pivoting of said latch means.

3,941,412

HOSE HANDLING APPARATUS

Hubert T. Carpenter, 3821 Pacific Heights Blvd., San Bruno, Calif. 94066

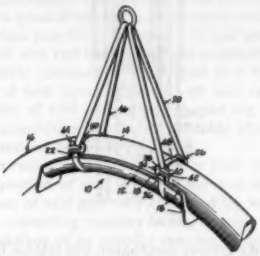
Filed Apr. 29, 1974, Ser. No. 464,857
Int. Cl.² B66C 1/16
U.S. Cl. 294—74 **2 Claims**

1. A hose handling apparatus comprising:

a substantially rigid hose saddle curved along its longitudinal axis and having a generally U-shaped cross-section adapted to receive a large diameter flexible hose;

a pair of closed hook connecting means fixedly connected at spaced-apart locations along one top edge of said hose saddle;

a pair of open hook connecting means fixedly connected at spaced-apart locations along the opposite top edge of said hose saddle so each is directly opposite a closed hook connecting means; and



sling lifting means having two loops, one of said loops passing through one of said closed hook connecting means and the other of said loops passing through said other closed hook connecting means, whereby a portion of each loop may be extended transversely across the hose saddle and detachably connected in the open hook connecting means whereby a choking force will be applied to a hose in the saddle as the latter is lifted through said two loops so connected in said open and closed hook connecting means, and said saddle can be quickly detached from said hose by merely disconnecting said loops from said open hook connecting means without complete release of said saddle from said loops.

3,941,413

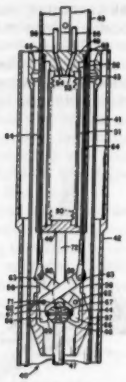
QUICK RELEASE LATCH FOR REACTOR SCRAM

Melvin L. Johnson, Wichita, Kans., and Bruce M. Shawver, San Jose, Calif., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Division of Ser. No. 476,184, June 4, 1974, Pat. No. 3,905,634.
This application Apr. 9, 1975, Ser. No. 566,485
Int. Cl.² B66C 3/16; G21C 7/08
U.S. Cl. 294—86 A **4 Claims**

1. A quick release mechanism for allowing rapid insertion of a control element into the core of a nuclear reactor for scram purposes comprising: a hollow drive member having a diverging-converging end section, a gripper assembly movably positioned within said hollow drive member and adapted to cooperate with a coupling head of an associated control element, and means including tensioning means for moving said gripper assembly such that tensioning said tensioning means causes said gripper assembly to retain an associated control element coupling head therein and release of tension on said tensioning means allows such a retained associated control element to be released therefrom for rapid insertion into an associated reactor core, said gripper assembly comprising a pliers-like gripper mechanism, said means for moving said gripper assembly comprising a bellows assembly movably secured within said hollow drive member, said tension means comprising cable means interconnecting said bellows assembly and said pliers-like gripper mechanism, whereby expansion of said bellows assembly causes tensioning of said cable means and tightening action of said pliers-like gripper mechanism about an associated control element coupling head re-

taining same therein, and contraction of said bellows assembly releases tension on said cable means allowing loosening action



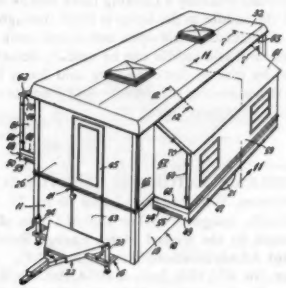
of said pliers-like gripper mechanism and release therefrom of such an associated control element coupling head.

3,941,414

CONVERTIBLE CAMPER TRAILER

Frederick J. Platt, 9 Surrey Drive, Huntington, Conn. 06484

Filed Nov. 18, 1974, Ser. No. 524,774
Int. Cl.² B60P 3/34
U.S. Cl. 296—23 G 5 Claims



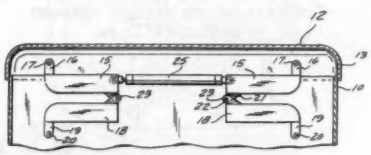
1. A convertible camper trailer comprising an oblong box base having opposed fixed parallel end walls and opposed fixed parallel side walls of substantially greater length than said end walls, a rectangular roof which is movable between a lowered position in which it engages the upper edges of the fixed walls of said box base and a raised position in which it is spaced above said fixed walls, said roof having opposed longitudinally-extending tracks on the underside thereof, opposed upper end wall sections, the lower edges of which are hingedly attached to the upper edges of each of the fixed end walls of said box base to adapt the end wall sections to pivot between folded position in which they are substantially perpendicular to said end walls when said roof is in lowered position and upright position in which they are coplanar with said end walls when said roof is in raised position, the upper portions of said end wall sections supporting opposed wheel means which engage the opposed tracks in the underside of the roof whereby movement of the upper end wall sections from folded to upright wall position causes said wheels to move in said tracks causing the roof to move from lowered to raised position, power means associated with said opposed upper end wall sections for moving said sections between folded and upright wall position while simultaneously moving said roof from lowered to raised position, and upper side wall extension panels hingedly mounted on the inside of said upper end wall sections, an extension assembly slidably mounted in each of said fixed side walls for sliding movement between closed position in which it is disposed within said box base and open position in which it extends outside said box base and beyond said fixed side wall, said extension assembly having a length less than the length of said fixed side walls and being centered within said fixed side walls so that end portions of said fixed side walls extend on each side of said extension assembly, said extension assembly comprising an extension base which is slidably mounted for movement in a direction perpendicular to said side wall, an upper side wall extension having a lower edge which is hingedly attached to said extension base and an upper edge which is hingedly attached to a roof extension panel, fastening means on the upper edge of said roof extension panel adapted to engage the roof, whereby when said extension assembly is in closed position said side wall extension and said roof extension are folded against said extension base and lie substantially parallel thereto and to each other and when said extension assembly is in open position said side wall extension is adapted to unfold to a position substantially perpendicular to said extension base and said roof extension is adapted to unfold to a position in which the fastening means thereof engage the roof, when the roof is in raised position, to connect the roof extension to the roof and support the extension assembly and said upper side extension panels are adapted to unfold from said upper end wall sections and to engage the upper edge of the fixed side walls and to engage the erect extension assembly to form upper side walls corresponding in length to the length of said end portions of said fixed side walls.

3,941,415

COLLAPSIBLE LIVING ENCLOSURE

Herbert Cooper, 1 Toms Point Lane, Port Washington, N.Y. 11056

Filed July 24, 1974, Ser. No. 491,547
Int. Cl.² B60P 3/34
U.S. Cl. 296—27 3 Claims



1. A mobile living enclosure comprising:

a generally polygonal mobile base having two pairs of sides meeting at corners;

a cover substantially congruent to said base and having a downwardly projecting lip engageable over and around said base;

at least a pair of two foldable posts each post having a laterally open and elongated channel-shaped lower section with a lower end pivoted on said base at a respective corner thereof, a laterally open and elongated channel-shaped upper section having an upper end pivoted on said cover at the corresponding corner thereof, and a connecting pivot between the upper end of said lower section and the lower end of said upper section, said upper and lower sections of each post being pivotally displaceable between an extended position forming a straight channel guide extending between said base and said cover and opening laterally toward the other post and a folded position with said sections generally parallel and opening laterally in opposite directions;

erecting means for each pair of posts including an extensible element having one end connected to one of said posts of the respective pair adjacent said connecting pivot thereof and another end connected to said other post of the respective pair adjacent the said connecting pivot thereof for displacing said posts between said folded position with said cover lying snugly over said base and fully enclosing said posts and said extended position with said cover spaced above said base and supported by said posts;

a retractable wall for each of said pairs of posts and formed of at least one rigid panel having opposite end edges, said walls each being displaceable between a closed position extending from a respective side of said cover to the corresponding side of said base with said end edges engaged in said channel guides in the extended positions of said posts and a retracted position permitting bending of said posts into said folded positions, whereby in said closed position of said walls said posts are prevented by said walls from being displaced into said folded positions.

3,941,416
FOLDING CHAIR

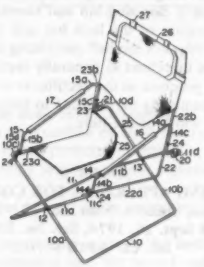
Suekichi Uchida, Aichi, Japan, assignor to Uchida Sharyo Co., Ltd., Nagoya, Japan

Filed June 24, 1974, Ser. No. 482,522

Claims priority, application Japan, Feb. 19, 1974, 49-20012[U]

Int. Cl.² A47C *4/28*

U.S. Cl. 297—45 **6 Claims**



1. A folding chair comprising:

a. a pair of generally U-shaped leg braces the legs of which are connected together to form a pair of X-shaped cross leg braces, said generally U-shaped leg braces each having a front upper end portion and a rear upper end portion, said upper end portions each having an axis extending substantially horizontally in mutually facing directions;

b. a pair of arm rest bars, each of said arm rest bars including a front section and a rear section, said front section having a front end portion with an axis extending forward in a substantially horizontal direction, and said rear section having a rear end portion with an axis extending backward in a substantially horizontal direction;

c. a pair of substantially L-shaped seat supporting bars, each of said seat supporting bars comprising a substantially horizontally extending portion which has front and rear ends and is inclined downward from the front end to the rear end, and a substantially vertically extending portion which has upper and lower ends and which is inclined backward from the lower end to the upper end;

d. a flexible seat mounted on said pair of seat supporting bars;

e. first fixing means for fixing said front section of said arm rest bar to said substantially horizontally extending portion of said seat supporting bar;

f. second fixing means for fixing said rear section of said arm rest bar to said substantially vertically extending portion of said seat supporting bar;

g. first connecting means for connecting said front end portion of said arm rest bar with said front upper end portion of said generally U-shaped leg brace such that one of the two can rock around its axis relative to the other; and

h. second connecting means for connecting said rear end portion of said arm rest bar with said rear upper end portion of said generally U-shaped leg brace such that one of the two can rock around its axis relative to the other said second connecting means including:

1. a connecting member having a first hole and a second hole perforated substantially in the horizontal direction with a prescribed vertical spacing therebetween;
2. said first hole being engaged with said rear end portion of said arm rest bar so that said connecting member is rotatable about the axis of said first hole, and said second hole being engaged with said rear upper end portion of said generally U-shaped leg brace so that said connecting member is rotatable about the axis of said second hole;
3. a pin radially projecting from at least one of the rear end portion of said arm rest bar and the rear upper portion of said generally U-shaped leg brace;
4. said connecting member having a recess formed in the end surface of an annular opening of one of said first and second holes in which said one portion is inserted, said radially projecting pin normally releasably engaging said recess, thereby preventing said one portion from being rotated about its axis; and
5. said pin being adapted to be disengaged from said recess by slightly withdrawing said one portion from the inserted hole, thereby permitting said one portion to axially rotate in the inserted hole, resulting in variation in the relative height of said one portion with respect to the other.

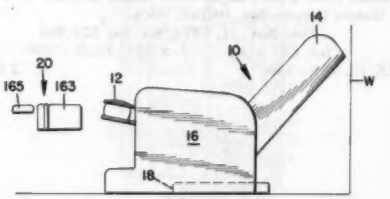
3,941,417
RECLINING CHAIR

Frank M. Re', Holyoke, Mass., assignor to Dual Manufacturing and Engineering Incorporated, Holyoke, Mass.

Continuation-in-part of Ser. No. 307,176, Nov. 16, 1972. This application Jan. 20, 1975, Ser. No. 542,519

Int. Cl.² A47C *1/02*

U.S. Cl. 297—85 **5 Claims**



3. A reclining chair movable by the occupant between upright sitting and intermediate-television and fully-reclined positions and positionable anywhere on a floor of a room and free of attachment to the floor and in close adjacency to a wall or object when in upright sitting position and yet so structured as to allow ready assumption of intermediate-television and fully-reclined positions free of contact with the wall or object comprising: a base, a chassis, a body-supporting subassembly including a seat and back having a pivotal relationship as to each other, a leg-supporting subassembly, a reclining linkage subassembly for controlling the pivotal movements of the seat relative to the back of the body-supporting subassembly and for effecting movement of the body-supporting subassembly between upright and intermediate and reclined positions concomitant with movement of the leg-supporting subassembly between retracted and extended positions respectively, and a

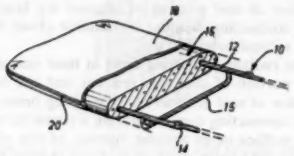
linear movement subassembly operatively connected to the reclining linkage mechanism for effecting movement linkage of both the chassis and body-supporting subassembly relative to the base responsively to and simultaneously with movement of the body-supporting subassembly relative to the chassis.

3,941,418

UPHOLSTERED SEAT

Charles Bernard, Paris, France, assignor to Airborne, S.A., Montreuil, France

Filed Dec. 26, 1974, Ser. No. 536,382
Claims priority, application France, Jan. 8, 1974, 74.00525
Int. Cl.² B60N *1/02*
U.S. Cl. 297—355 **7 Claims**



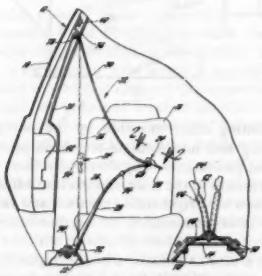
1. An upholstered seat comprising a mass of elastic plastic material having a top surface adapted to receive thereon portions of a user's body, and a bottom surface opposite said top surface, said seat further comprising a supporting structure including a plurality of rigid structural elements which are pivotally connected to each other, at least one supporting element adapted to support said seat on the ground, and being rigidly attached to at least one of said rigid structural elements, said supporting structure and said supporting element attached thereto being entirely embedded within said plastic material mass in such a manner that the free ends of said supporting element are substantially flush with said bottom surface of said plastic material mass.

3,941,419

BUCKLE COMPONENT FOR A VEHICLE OCCUPANT RESTRAINT BELT SYSTEM

Hubert Peter Blom, Royal Oak, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 21, 1974, Ser. No. 525,968
Int. Cl.² A44B *11/12, 11/25*; A62B *35/00*
U.S. Cl. 297—389 **2 Claims**



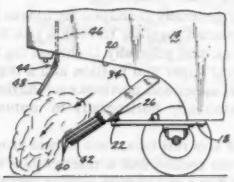
1. In a vehicle occupant restraint belt system including a flat belt with an elongated configuration extending between upper and lower portions of the vehicle on one side of an associated seat, the belt having a predetermined width between opposite side edges thereof, a belt retractor receiving the upper end of the belt so as to store the belt and permitting withdrawal of the belt therefrom for use, and a fixed buckle component secured adjacent the other side of the seat, an improved sliding buckle component slidably disposed along the belt comprising: a metallic housing including an attachment portion for selectively securing the sliding buckle component to the fixed buckle component so the belt defines angularly disposed lap and shoulder belt portions, the housing also including a downwardly projecting rectilinear locking portion extending transversely with respect to the elongated direction of the belt with approximately the same length as the width of the belt, the housing having upwardly extending flange portions defining a slot at each side of the housing, an external lock bar having a rectilinear portion extending alongside the locking portion of the housing with the belt received therebetween, the lock bar having a slightly greater length than the width of the belt and the housing and having end portions extending from the rectilinear portion about the side edges of the belt back toward each other in generally U-shaped configurations, the end portions of the lock bar being loosely engaged in the slots at each side of the housing and having first and second side edges which alternatively provide a pivot axis for pivotal movement of the lock bar relative the housing so that a manually applied upward pull on the shoulder belt portion when the buckle components are secured to each other pivots the lock bar about the first side edge of the locking bar end portions and away from the locking portion and slides the belt through the buckle component between the lock bar and housing to tension the lap belt portion, this tension of the lap belt portion pivoting the lock bar about the second side edge of the locking bar end portions toward the downwardly projecting locking portion of the housing to clamp the belt at the juncture between the angularly disposed lap and shoulder belt portions, and the configuration of the lock bar and the manner it extends about the edges of the belt permitting the lap and shoulder belt portions to extend in generally rectilinear configurations from their juncture at the rectilinear portion of the lock bar as well as permitting the housing to have a width equal to or less than the width of the belt.

3,941,420

DUMPING APPARATUS FOR COMBINES

Harold D. Klasna, Spencer, Nebr. 68777

Filed Sept. 16, 1974, Ser. No. 506,301
Int. Cl.² A01D *90/10*
U.S. Cl. 298—26 **8 Claims**



1. In combination with a combine having a threshed material discharge opening at its rearward end, comprising,

a threshed material dumping apparatus mounted on the rearward end of the combine adjacent said discharge opening and adapted to receive threshed material therein,

said dumping apparatus comprising a substantially horizontally disposed bottom wall member pivotally secured to said combine about a horizontal axis so that said bottom wall member may pivot from its normal substantially horizontally disposed position to a dumping position,

said bottom wall member having rearward and forward ends,

mounting means pivotally mounting said bottom wall member to said combine,

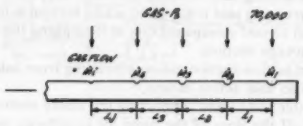
said mounting means being positioned intermediate the forward and rearward ends of said bottom wall member whereby the bottom wall member is normally positioned

in its substantially horizontally disposed position, said bottom wall member automatically moving to its dumping position when the threshed material accumulates thereon to a predetermined load, the position of said mounting means relative to said bottom wall member causing said bottom wall member to automatically return to its horizontally disposed position after moving to its dumping position.

3,941,421

APPARATUS FOR OBTAINING UNIFORM GAS FLOW THROUGH AN IN SITU OIL SHALE RETORT

Robert S. Burton, III, Grand Junction, Colo.; Chang Yul Cha, LaVerne, Calif., and Richard D. Ridley, Grand Junction, Colo., assignors to Occidental Petroleum Corporation, Los Angeles, Calif.

Filed Aug. 13, 1974, Ser. No. 496,968
Int. Cl.² E21C *41/10*
U.S. Cl. 299—2 **4 Claims**

1. An in situ oil shale retort comprising:
a cavity within a subsurface oil shale formation substantially filled with broken particles of oil shale;
a tunnel extending into the cavity adjacent the bottom of the cavity;
a plurality of gas exhaust pipes traversing the bottom of the cavity;
means supporting the pipes above the bottom of the cavity, said pipes extending into the tunnel, said pipes having a plurality of holes in the portions of said pipes traversing the bottom of the cavity, said holes being graded in size along the length of said pipes with the smallest holes being adjacent the end of the exhaust pipes where the exhaust pipes enter the tunnel; and
means connected to said pipes for withdrawing gas through the pipes from the cavity.

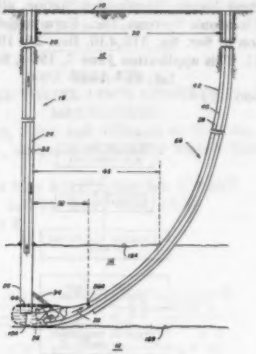
3,941,422

METHOD OF INTERCONNECTING WELLS FOR SOLUTION MINING

John Keller Henderson, 4012 E. 41 Place, Tulsa, Okla. 74135

Filed May 20, 1974, Ser. No. 471,286
Int. Cl.² E21B *43/28;* **E21C** *41/08;* **E21B** *43/26*
U.S. Cl. 299—4 **3 Claims**

1. The method of producing a soluble chemical material by solution mining a subterranean formation thereof, comprising:
a drilling a conventional well into the formation;
b directionally drilling a deflected well, displaced by a selected distance at the earth's surface from said conventional well, said deflected well being directed toward said conventional well so that the bottom thereof approaches within a selected distance of the bottom of said conventional well in said formation;
c solution mining said deflected well to form a cavern in the formation to decrease the distance between the well bottoms;
d fracturing the formation between the bottoms of said two wells to achieve a liquid flow connection between said two wells; and



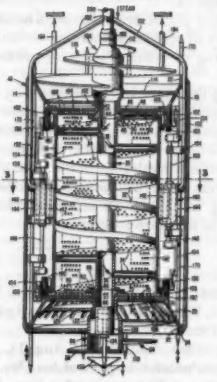
e flowing a solvent down through one of said wells and a solution out the other of said wells.

3,941,423

METHOD OF AND APPARATUS FOR EXTRACTING OIL FROM OIL SHALE

Gilbert M. Garte, 62 Curtis St., Scituate, Mass. 02066

Filed Apr. 10, 1974, Ser. No. 459,641
Int. Cl.² E21B *43/24;* **E21C** *41/10*
U.S. Cl. 299—8 **14 Claims**



12. A method of extracting oil from an oil-bearing formation comprising the steps of:
a. excavating by means of a self-digging excavating apparatus until said formation has been reached;
b. directing the material in the formation inwardly of said apparatus;
c. directing steam under pressure to the interior of said apparatus for extracting oil in the form of a vapor product from said material;
d. applying a vacuum to the interior of said apparatus for withdrawing said vapor product to the surface for condensation, and
e. withdrawing said apparatus under its own power from the excavating opening thereby leaving the tailings in said excavation opening.

3,941,424

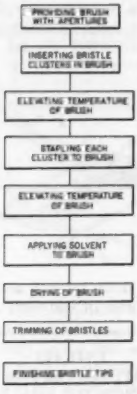
ULTRASONIC TOOTHBRUSH APPLICATOR

Lewis Balamuth, Southampton; Michael R. Rutten, East Islip, and Robert Meyer, Huntingdon Station, all of N.Y., assignors to Ultrasonic Systems, Inc., Farmingdale, N.Y.

Division of Ser. No. 318,430, Dec. 26, 1972, Pat. No. 3,840,932. This application June 7, 1974, Ser. No. 477,306

Int. Cl.² A46D *3/04*

U.S. Cl. 300—21 **25 Claims**



1. The method of manufacturing toothbrush adapted to be mounted on an automatic toothbrush power handle having as a power source vibratory energy in the ultrasonic range, comprising the steps of:

A. providing a plastic brush having a head portion including a plurality of apertures therein;

B. positioning of bristle cluster respectively in each aperture;

C. changing the shape of the aperture by effecting a flow of the plastic in said respective aperture into substantially surrounding relationship with the bristles in each aperture therein, whereby the plastic solidifies in adhesive relationship to the bristles to transmit the ultrasonic vibratory energy from the brush head portion to the bristles; and

D. coupling to said brush securing means adapted to be coupled to said power handle.

3,941,425

MOBILE SLURRY HANDLING SYSTEM

Eric H. Reichl, Pittsburgh, Pa., assignor to Consolidation Coal Company, Pittsburgh, Pa.

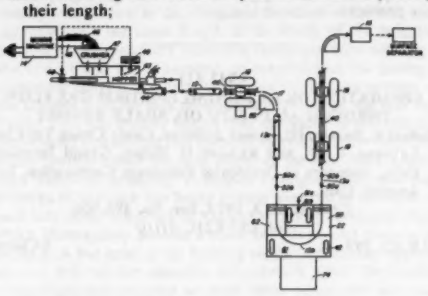
Continuation of Ser. No. 389,273, Aug. 21, 1973, abandoned, which is a continuation-in-part of Ser. No. 294,720, Oct. 3, 1972, abandoned. This application Nov. 4, 1974, Ser. No. 520,685

Int. Cl.² B65G *53/54*

U.S. Cl. 302—14 **9 Claims**

1. In an apparatus for transporting product from a mining machine working in a mine having a floor, to a terminal having a source of water with a slurry inlet, and a source of water; first and second flexible hose means; means for interconnecting one end of said first and second flexible hose means to said slurry inlet of said terminal and to said source of water, respectively; means for mixing the product dislodged by said mining machine with said water to form a slurry and having a water inlet and a slurry outlet; means for connecting the remaining end of said first and second flexible hose means to said slurry outlet and said water inlet, respectively; means for maintaining said product mixing means in position to receive product from the mining machine; said first and second flexible hose means each having the same length, and wherein said length is greater than the distance between the terminal and the product mixing means in all but the most remote position of the mining machine with respect to the terminal, an improvement in said first and second flexible hose means comprising:

means securing said hoses in parallel realtionship along their length;



means arranging said hoses in a storage section;

means arranging said hoses in an active section substantially parallel to said storage section at least along the length of said storage section;

a 180° transition section means extending from said storage means to said active means;

means attached to and supporting the active section of said hoses off the floor of the mine for lengthwise movement upon movement of said product mixing means; and means providing a neutral, or tension force along the length of said active section.

3,941,426

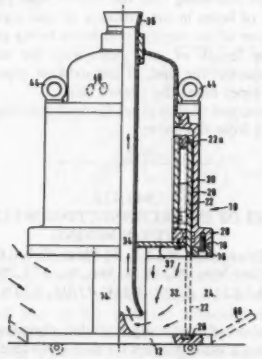
APPARATUS FOR HANDLING FLOWABLE MATERIAL

William John Courtney Trythall, Morpeth, England, assignor to Trythall Design and Development Ltd., Fareham, England

Filed Jan. 17, 1975, Ser. No. 542, 054

Int. Cl.² B65G *53/40*

U.S. Cl. 302—26 **7 Claims**



1. An apparatus for handling flowable material comprising a base providing an annular valve seat, a support plate spaced from the base having inner and outer concentric casings supported thereon, a pneumatically operable annular closure member located in an annular chamber defined between the casings and mounted for movement between a retracted position in which a material inlet provided between said support plate and said base is open and an extended position in which the closure member engages said valve seat to close said inlet, a material outlet tube opening adjacent said base and extend-

ing axially away therefrom through the interior of the inner casing, and pneumatic control means for controlling the opening and closing of said inlet by the closure member, and means for directing air under pressure to the space enclosed by the closure member when the closure member is in its extended position to transport material from that space through the outlet tube.

3,941,427

ANTI-SKID BRAKING SYSTEM FOR VEHICLES

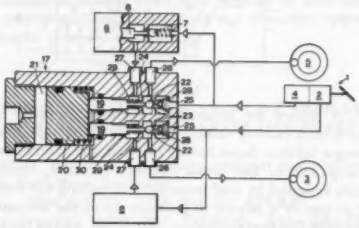
David Anthony Harries, Shirley, England, assignor to Girling Limited, Birmingham, England

Filed Nov. 26, 1973, Ser. No. 418,873

Claims priority, application United Kingdom, Dec. 2, 1972, 55775/72

Int. Cl.² B60T 8/06

U.S. Cl. 303—21 AF **2 Claims**



1. An hydraulic braking system for a vehicle comprising a plurality of wheel brakes, a pedal-operated master cylinder controlling hydraulic fluid under pressure to said wheel brakes, skid sensing means for providing a control signal when the deceleration of a braked wheel exceeds a predetermined value, a plurality of modulators each defining a variable volume modulator chamber, a common fluid pressure source for actuating all of said modulators, a respective inlet to each of said modulators chambers connected to said master cylinder, a respective inlet valve controlling each of said inlets and maintained normally open by fluid pressure from said common source acting across a respective movable wall, a respective outlet from each of said chambers connected to a respective one of said wheel brakes, means responsive to said signal for operating said modulators each modulator when operated closing a respective one of said inlet valves and increasing the volume of its respective modulator chamber, a respective connection between said master cylinder and a respective one of said wheel brakes by-passing the modulator associated with that wheel brake, a respective normally closed by-pass valve controlling each of said by-pass connections, a respective normally open isolating valve provided on the downstream side of each modulator output, each of said isolating valves being combined with a respective one of said by-pass valves to define a single double-seat valve, and all of said by-pass and isolating valves being combined in a single valve assembly comprising a housing, a safety piston working in a bore in the housing and subjected to fluid pressure from said common fluid pressure source, a respective control piston for each of said double seat valves, said control pistons being arranged side by side in bores in the housing parallel to the safety piston bore and being acted upon by the safety piston, each of said double-seat valves comprising a first valve seat located between a respective inlet connected to said master cylinder and a respective outlet connected to a respective brake, a second valve seat located between a respective second inlet connected to the respective outlet of the respective modulator and said respective valve outlet, a respective valve member for engagement alternatively with said first and second valve seats, all of said valve members normally being held in engagement with said first seats and spaced from said second seats by said safety piston to hold closed said first by-pass valves and to hold open said isolating valves, and resilient means acting on said safety piston in opposition to the fluid pressure acting on said piston whereby in the event of a failure of said common fluid pressure source the force holding said valve members against said first seats is relieved.

3,941,428

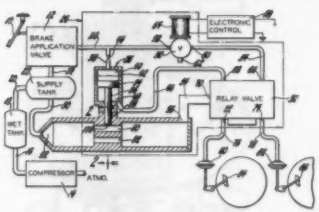
AIR BRAKE WHEEL LOCK CONTROL VALVE MECHANISM

Jack L. Rothwell, Flint, and Williams S. Warren, Flushing, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 8, 1975, Ser. No. 575,657

Int. Cl.² B60T 8/06, 15/12

U.S. Cl. 303—21 F **2 Claims**



1. In an air brake system for an automotive vehicle, said system having

a source of supply air pressure;

a brake application valve receiving air pressure from said source and operable to generate pilot brake apply pressures from the supply air pressure;

a normally open solenoid closed valve having an inlet and an outlet normally in communication with each other, and an atmospheric vent adapted to be connected with said outlet with said inlet closed when the solenoid is energized to close said valve, said inlet receiving pilot brake apply pressure from said brake application valve;

wheel lock control means for energizing the solenoid while incipient wheel lock is present at a wheel being braked;

a relay valve connected with said normally open valve outlet for receiving the pilot brake apply pressures passing through said normally open valve and generating corresponding brake apply pressures from the supply air pressure, said relay valve having a supply air inlet connected with said source and a delivery outlet connected with a wheel brake actuator;

and a supply air restrictor for selectively restricting air flow from said source of supply air pressure to said relay valve supply air inlet;

the improvement comprising:

a continuously open restrictive flow conduit receiving pilot brake apply pressures from said brake application valve and a relatively less restrictive flow conduit connected fluidly intermediate said normally open valve outlet and said relay valve;

said supply air restrictor including a power wall and plunger having one power wall side connected to said restrictive flow conduit and the other, lesser effective area, power wall side connected to said relatively less restrictive flow conduit and a plunger end exposed to supply air pressure;

whereby when said normally open valve is open and the brake system is actuated to apply the brake, pressure builds up at a slower rate on said power wall one side than on said power wall other side to hold said restrictor inactive, and when said normally open valve is closed to connect said normally open valve outlet to atmosphere and so vent said power wall other side to atmosphere, said restrictor is activated and thereafter held activated until

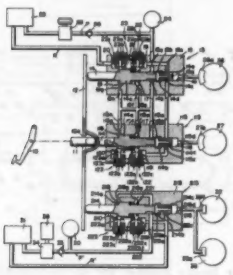
pressure on said power wall one side is vented to atmosphere by release of the brake application valve.

3,941,429

BRAKE CONTROL SYSTEM FOR VEHICLES

Kazutaka Kuwana, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Dec. 13, 1974, Ser. No. 532,644
Claims priority, application Japan, Dec. 21, 1973, 49-1395
Int. Cl.² B60T 8/08
U.S. Cl. 303—21 F 5 Claims



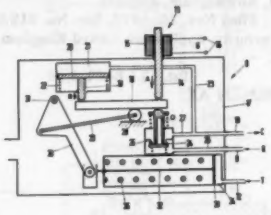
1. Brake control system including a fluid reservoir, hydraulic pressure source means, brake control valve means, means for actuating said brake control valve means, and brake means including at least one brake actuating means connected with said brake control valve means, said brake control valve means including at least one brake pressure control valve comprising a valve housing having an axial bore provided with an inlet port for connection with said hydraulic pressure source means, an outlet port for connection with said brake actuating means and a return port for connection with said fluid reservoir, a valve spool slidably disposed in said axial bore of said valve housing, said valve spool having land means defining within said valve housing a first control chamber at one side of said land means and a second control chamber at the other side, means provided in said valve spool for connecting said inlet port with said outlet port when said valve spool is slidably displaced toward a first direction in said axial bore of said valve housing, means provided in said valve spool for connecting said outlet port with said return port when said valve spool is slidably displaced toward a second direction in said axial bore of said valve housing, said outlet port being so disposed that pressure therein serves to bias said valve spool toward the second direction, said first and second control chambers being so disposed that pressure in said first chamber biases said valve spool toward the second direction while pressure in said second chamber biases said valve spool toward the first direction, first and second restricted passages connecting, through said first and second chambers respectively, said hydraulic pressure source means to said fluid reservoir, means provided in at least one of said first and second restricted passages for regulating pressure in said first and second chambers, and means for actuating said regulating pressure means upon detection of braking force conditions which exceed or are below certain predetermined levels, and wherein said means for actuating said brake control valve means includes means for actuating said valve spool toward the first direction.

3,941,430

ELECTRICALLY CONTROLLED LOAD-RESPONSIVE AIR BRAKING SYSTEM

Gerhard Kubath, and Hans Pöllinger, both of Munich, Germany, assignors to Knorr-Bremse GmbH, Munich, Germany

Filed Dec. 18, 1974, Ser. No. 533,836
Claims priority, application Germany, Dec. 18, 1973, 2362800
Int. Cl.² B60T 8/18
U.S. Cl. 303—22 R 2 Claims



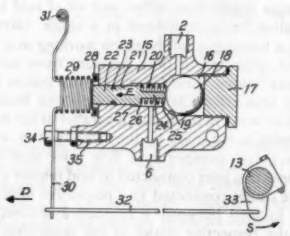
1. A device for controlling a load-responsive air brake system on a railway vehicle by an electrical signal, and comprising a balance beam having one end and another end which is subjected to the brake cylinder pressure, double valve means actuated by said beam for connecting the brake cylinder to one of a source of pressure or to the atmosphere, an adjustable fulcrum supporting said beam, means responsive to the load of the vehicle for adjusting said fulcrum to vary the lever arm ratio of forces acting on the ends of the beam as a function of the vehicle load, and electromagnetic means including a movable armature therein acting against said one end of the said beam for receiving an electrical signal whereby when an electrical signal is received such that the brake cylinder pressure acting on the beam is predominant the double valve is actuated to connect the brake cylinder to the atmosphere and when an electrical signal is received such that the force applied by the armature is predominant the double valve is actuated to connect the brake cylinder to the source of pressure.

3,941,431

INERTIA AND LOAD RESPONSIVE DEVICE FOR LIMITING BRAKING PRESSURE

Jean Louis Giordano, Noisy-le-Roi, and Michel Guettier, Rueil, both of France, assignors to Regie Nationale des Usines Renault and Automobiles Peugeot, both of, France

Filed May 22, 1974, Ser. No. 472,120
Claims priority, application France, June 5, 1973, 73.20413
Int. Cl.² B60T 8/12
U.S. Cl. 303—24 A 5 Claims



1. In an automobile braking system, a device limiting braking pressure comprising a limiter body which has an inlet orifice and an outlet orifice and a valve mounted therein for

cutting off said inlet orifice from said outlet orifice, a movable piston subject to the hydraulic pressure at said inlet orifice, an inertial mass disposed within said body for movement with respect to said body in response to deceleration of a vehicle carrying the system and operatively associated with said valve load-sensitive means, and elastic means for co-operation with said inertial mass and said piston, said load-sensitive means cooperating via a group of elastic members with said inertial mass and with said piston in the direction in which said valve opens, and the force of the pressure at said inlet orifice being exerted against a working face of said movable piston in opposition to the contrary force exerted by a load, said valve being closed as a result of the effect of hydraulic pressure and inertial force acting upon said inertial mass at a predetermined vehicle deceleration, the closure of said valve at said predetermined vehicle deceleration being established by the resultant of a plurality of forces including the hydraulic pressure force acting on said piston, the inertial force acting upon said inertial mass upon deceleration of the vehicle, a pre-load force corresponding to vehicle load and applied to said piston through one of said elastic members in a direction opposing said hydraulic pressure force.

3,941,432
CHANGE-OVER VALVE FOR TWO-LINE TRAILER BRAKE SYSTEMS WITH AT LEAST ONE BRAKE CIRCUIT

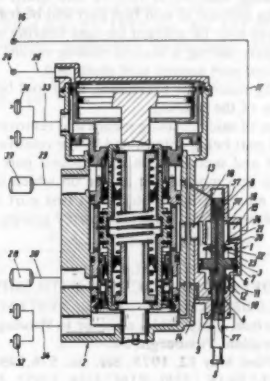
Roland Blanz, Heidelberg, Germany, assignor to Graubremse GmbH, Heidelberg, Germany

Filed Aug. 21, 1974, Ser. No. 499,420

Claims priority, application Germany, Aug. 23, 1973, 7330765

Int. Cl.² B60T 15/06

U.S. Cl. 303—52 **8 Claims**



1. A change-over valve for use with a trailer brake system having two brake circuits and at least one emergency brake chamber, said change-over valve comprising:

a housing having first and second ports for connection to compressed fluid supply tanks for both brake circuits of the trailer brake system and having a third port for connection to at least one emergency brake chamber of the trailer brake system;

a slide sealingly guided within said housing for movement between a first position and a second position;

a piston guided within said housing and coupled to said slide for movement together therewith;

a fourth port formed in said housing for supplying compressed fluid to said piston to move said slide to said first position;

a common space formed within said housing and coupled to said third port;

means for manually moving said slide to said second position; and

two channels formed in said slide and positioned so that said slide connects the first and second ports to the third port via said channels, said common space, and a check valve when said slide is moved to the second position and disconnects the first and second ports from the third port when said slide is moved to the first position.

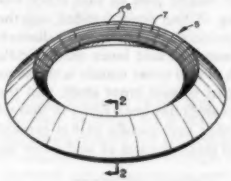
3,941,433
FLEXIBLE BEARING HAVING LOW TORQUE RESISTANCE

William T. Dolling, and Jack R. Kapp, both of Brigham City, Utah, assignors to Thiokol Corporation, Newtown, Pa.

Filed May 5, 1975, Ser. No. 574,674

Int. Cl.² F16C 7/00

U.S. Cl. 308—2 R **5 Claims**



1. In a flexible bearing constructed of alternate layers of rigid material and elastomer stacked and bonded together, the improvement wherein the central portion of each layer of elastomer is of a lower, shear modulus of elasticity than the elastomer at the edge portions thereof, whereby the bearing is more yielding to forces parallel to the layers.

3,941,434
HYDROSTATIC BEARING

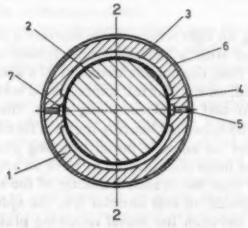
Rainer Schurger, Schwanfeld; Erich Burkl, Stammheim, and Lothar Walter, Schweinfurt, all of Germany, assignors to SKF Industrial Trading and Development Company, B.V., Amsterdam, Netherlands

Filed Sept. 26, 1974, Ser. No. 509,322

Claims priority, application Germany, Oct. 13, 1973, 2351494

Int. Cl.² F16C 1/24

U.S. Cl. 308—9 **5 Claims**

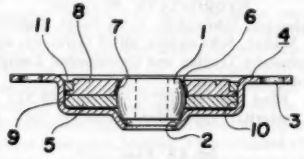


1. A hydrostatic radial bearing comprising a cylindrical sleeve, the inner surface of which is formed with at least one pair of compartments circumferentially spaced about its periphery, adjacent ones of said compartments being separated by an axial web, each of a pair of diametrically opposed webs having a chamber extending parallel to the axis of said sleeve and a hole extending radially through said sleeve communicating with its associated chamber for connection to a source of bearing media under pressure.

3,941,435
ROLLER
Jorma Aarne Kullervo Tuomaala, Karhula, Finland, assignor to A. Ahlstrom Osakeyhtio, Finland
Filed Jan. 27, 1975, Ser. No. 544,562
Claims priority, application Finland, Feb. 1, 1974, 289/74
Int. Cl.² F16C 13/00
U.S. Cl. 308—20 10 Claims

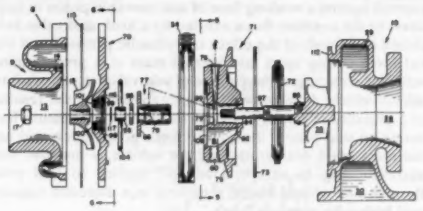
1. A roller with an outer mantle and an inner shaft, the middle part outer diameter of said inner shaft being greater than the outer diameter of its other parts and said outer mantle having been joined by shrinking to said middle part of said inner shaft, said outer mantle parts being supported by said greater-diameter middle part of said inner shaft, said outer mantle consisting of two pipes welded together, have been thinned on the inside so that their inner diameter is the same as the outer diameter of said inner shaft middle part and the combined length of said outer mantle is the same as the length of said middle part of said inner shaft, and that said middle part of said inner shaft has been fitted so that when said pipes are welded together said middle part is pressed between the shoulders of said thinned parts of said outer mantle.

3,941,436
BEARING FOR LIGHT ROTARY SHAFTS
Hachiro Kazama, Tokyo, Japan, assignor to Kabushiki Kaisha Ochiai Seisakusho, Tokyo, Japan
Filed Apr. 10, 1975, Ser. No. 566,687
Int. Cl.² F16C 9/06, 23/00
U.S. Cl. 308—72 1 Claim



1. A bearing for light rotary shafts wherein a metal receiving plate provided with a hemispherical recess of a diameter slightly larger than the outside diameter of a spherical bearing metal is formed, an annular felt impregnated with a lubricating oil is fitted to said metal receiving plate, the intermediate periphery of the spherical bearing metal is fitted to said annular felt, further an annular metal pressing plate having the edge part of an inner hole formed to be of an arc of a diameter slightly larger than the outside diameter of the spherical bearing metal is placed on said annular felt, the spherical bearing metal is held between the metal receiving plate and annular metal pressing plate by leaving a very slight clearance between it and the arc of the inner hole of said annular metal pressing plate and between it and the hemispherical recess of the metal receiving plate and the metal receiving plate and annular metal pressing plate are integrally combined with each other by filling an annular groove formed of the peripheral edge step part of the annular metal pressing plate and the inner peripheral surface of the metal receiving plate with an organic binder.

3,941,437
BEARING HOUSING FOR HIGH SPEED ROTATING SHAFTS
Hugh MacInnes, La Canada, and Paul M. Uitti, Huntington Beach, both of Calif., assignors to Rajay Industries, Inc., Long Beach, Calif.
Filed Dec. 27, 1973, Ser. No. 428,832
Int. Cl.² F16C 33/66
U.S. Cl. 308—121 5 Claims



1. A high speed bearing housing means comprising two parts for receiving a shaft and bearing means that circumscribes a portion of said shaft with the shaft connecting at least two rotatable thrust load producing members in a spaced-apart relation:

a first part of said two parts of said bearing housing means being adapted to receive said shaft and bearing means, said first part having means to receive and means to remove a fluid from said first part and a first sealing means for sealing said first part around said shaft, said fluid lubricating said shaft and bearing means to allow easy rotation of the shaft therein;

a second part of said two parts of said bearing housing means being adapted to receive said shaft, said second part being secured to said first part and bearing any axial thrust that may be exerted on said bearing means; said second part having a second sealing means for sealing said second part around said shaft; and

third sealing means for preventing fluid loss between said two parts of the housing;

the location of said receiving means and removing means in said first part being determined by the relative position of said first and second parts, said second part being positioned to accomodate the device on which said bearing housing means is being used, said first part being rotatably positioned to allow fluid flow by gravity.

3,941,438
DYNAMOELECTRIC MACHINE WITH IMPROVED LUBRICATION WICKING SYSTEM
Thomas Charlton, Lima, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed May 12, 1975, Ser. No. 576,949
Int. Cl.² B61F 17/00; F16C 1/24, 13/02, 33/66
U.S. Cl. 308—132 9 Claims

1. A dynamoelectric machine with an improved lubrication system and comprising:

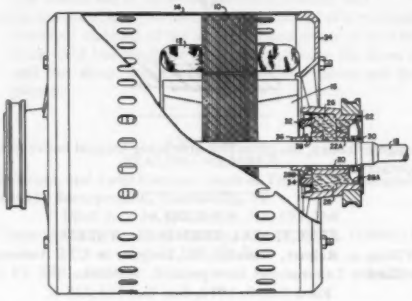
a stator;

a rotor within said stator and located on a shaft;

at least one bearing for permitting rotation of said shaft and rotor, said bearing comprising a cylindrical sleeve type bearing surface mounted in a housing secured to said stator;

a wicking arrangement for continuously supplying liquid lubricant to said bearing surface, said wicking arrangement comprising a feeder wick extending from within said housing through a window in said bearing surface to contact said shaft, a mass of particulate wicking material within said housing away from said window and in close contact with surfaces of said feeder wick, said mass of wicking material being less lubricant retentive than said

feeder wick, a collector wick that is ring shaped and secured within said housing and has a surface abutting against an end of said mass of particulate wicking material, said collector wick being proximate and exposed to



a lubricant flinger mounted on said shaft, said collector wick comprising an open celled foamed plastic material whose density and lubricant retentivity is less than said feeder wick and said mass of particulate wicking material.

3,941,439

SHOCK ABSORBER BEARING ASSEMBLY

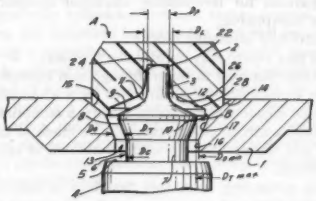
Paul Piguet, La Chaux-de-Fonds, Switzerland, assignor to Portescap, La Chaux-de-Fonds, Switzerland

Filed Feb. 27, 1975, Ser. No. 553,632

Claims priority, application Switzerland, Feb. 27, 1974, 2755/74

Int. Cl.² F16C *17/06, 17/08, 19/10, 19/30*

U.S. Cl. 308—159 **6 Claims**



1. A shock-absorber bearing assembly comprising, a shaft having a pivot end portion including an end pivot section; a bearing housing having an opening therein through which said pivot end portion of the shaft extends; and a bearing mounted on said housing and having an aperture formed therein for receiving the end pivot section of the shaft; said shaft having an enlargement formed thereon below said end pivot section and located within said opening in the housing, said opening in said housing having a first cylindrical section and a second axially aligned tapered section between said cylindrical section and the bearing mounted thereon, said tapered section tapering from a minimum diameter adjacent said cylindrical section to a maximum diameter adjacent said bearing whereby side play between said enlargement and the sides of the opening in the housing progressively decreases as the end pivot section is moved away from the bearing out of the aperture therein.

3,941,440

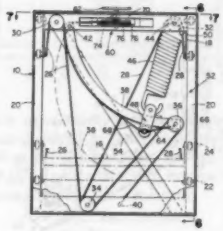
SELF-LEVELING DISPENSER

Marvin Menzin, Lexington, and Hugh A. Robinson, Wenham, both of Mass., assignors to Peters and Company, Inc., Dorchester, Mass.

Continuation of Ser. No. 379,347, July 16, 1973, abandoned. This application Sept. 17, 1974, Ser. No. 506,930

Int. Cl.² A47B *9/02;* **A47F** *1/04;* **B65H** *1/20*

U.S. Cl. 312—71 **17 Claims**

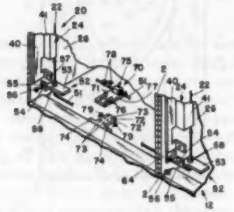


1. In a self-leveling dispenser of the type having stationary structure, an elevator platform for a stack of pieces to be dispensed, a suspension system for the platform, and an adjustable spring system connected through said suspension system to the platform, the spring system operable to progressively raise the platform as the platform load decreases and comprising an elongated lever rotatable about a pivot, a suspension system connector on said lever spaced at a first moment arm distance from said pivot for application of elevator platform load to said lever at an angle thereto, a spring, a spring connector on said lever spaced at a second moment arm distance from said pivot for application of spring load to said lever at an angle thereto, and an adjustment device for varying the position along said lever of at least one of said connectors or said pivot to change the ratio of said two moment arms and thereby the load rating of said dispenser, the improvement wherein first and second elongated flexible strands are secured to the member to be adjusted along said lever, and extend in opposite directions therefrom along said lever, at least one of said strands turning back about a pulley surface mounted on said lever, and both of said strands leaving said lever in the vicinity of the lever pivot point and extending to a take-up and pay-out device mounted on said stationary structure, said device being operable to take up and pay out the respective strands and vice versa, to adjust the position of said member and thereby the ratio of said moment arms, and a means to secure said strands in a selected position thereby to fix said ratio of moment arms.

15. In a self-leveling dispenser of the type having stationary structure, an elevator platform for a stack of pieces to be dispensed, a suspension system for the platform, and an adjustable spring system connected through said suspension system to the platform, the spring system operable to progressively raise the platform as the platform load decreases and comprising an elongated lever rotatable about a pivot, a suspension system connector on said lever spaced at a first moment arm distance from said pivot for application of elevator platform load to said lever at an angle thereto, a spring, a spring connector to said lever spaced at a second moment arm distance from said pivot for application of spring load to said lever at an angle thereto, and an adjustment device for varying the ratio of said two moment arms and thereby the load rating of said dispenser, the improvement wherein said lever is pivoted at one end, said suspension system connector is fixed at the opposite end of said lever and said spring connector is movable through said range along a portion of said lever between said two ends, said spring being a tension spring and being connected to said spring connector from a pivot on said stationary structure and said lever being concave about said

spring pivot and the line of action of said tension spring therefrom.

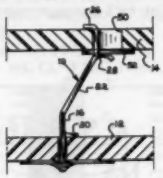
3,941,441
DRAWER INTERLOCK SYSTEM
Douglas Scheerhorn, Grand Rapids, Mich., assignor to Steelcase Inc., Grand Rapids, Mich.
Filed Jan. 2, 1974, Ser. No. 429,582
Int. Cl.² E05B *65/46*
U.S. Cl. 312—215 **21 Claims**



1. In a cabinet having at least two adjacent rows of drawers, each row including a plurality of drawers, a drawer interlock mechanism for allowing only one drawer in both said rows to be opened at any one time, said interlock mechanism comprising: first interlocking means located adjacent and along said first row of drawers for engaging each drawer in said first row; second interlocking means located adjacent and along said second row of drawers for engaging each drawer in said second row; each of said first and second interlocking means including movement restricting means for preventing the opening of all other drawers in said respective row when one of said drawers in that row is opened, each of said interlocking means being shiftable between a first operative condition in which said movement restricting means allow any one of its said associated drawers to be opened and a second operative condition in which said movement restricting means prevent the passage of the remaining drawers in said respective row so that drawers cannot be opened; each said drawer and its associated interlocking means including shifting means cooperating to shift said interlocking means from its first condition to its second condition as one of said drawers is opened; connecting means interconnecting each of said first and second interlocking means including means for shifting one of said interlocking means when the other of said interlocking means is shifted by said first mentioned shifting means whereby the shifting of either of said first and second interlocking means into its said second operative condition simultaneously shifts the other of said first and second interlocking means into its second operative condition.

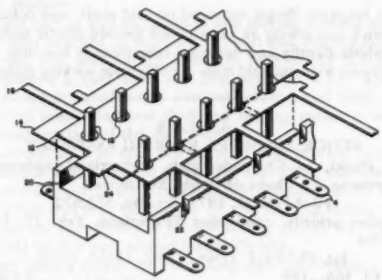
3,941,442
DAUGHTER BOARD CONTACT
Lindsay Carlton Friend, Camp Hill, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Division of Ser. No. 404,290, Oct. 9, 1973. This application June 24, 1974, Ser. No. 482,366
Int. Cl.² H01R *13/54*
U.S. Cl. 339—17 M **1 Claim**

1. A daughter board contact terminal comprising a base, circuit contact means on the base, a flexible pivot link arm extending away from said base in a first direction and having daughter board-engaging hook means on the free end thereof, and a pair of flexible cantilever spring contact arms spaced apart from said link arm and extending from said base in the same direction as said link arm and having contacts at the free ends thereof both located adjacent said daughter board-engaging hook means for engaging a contact pad on the



daughter board, the pivot link arm being located between said contact arms.

3,941,443
ELECTRICAL TERMINAL SYSTEM
William A. Reimer, Wheaton, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.
Filed Oct. 9, 1974, Ser. No. 513,355
Int. Cl.² H01R *13/60*
U.S. Cl. 339—17 C **3 Claims**



1. Apparatus for terminating electrical componets, said apparatus comprising:

an electrically insulative block;

at least one electrically conductive terminal,

said terminal disposed through through said insulative block, extending from a first face thereof to form a circuit terminal and from an adjacent face thereof to form a component terminal, whereby a circuit connection may be made to said circuit terminal and the component lead terminated at said component terminal;

wherein projecting from said first face of said block are parallel first and second rows of said circuit terminals, said second row of circuit terminals directly opposite said first row, said component terminals forming a first and second row,

said first row of component terminals projecting from the respectively adjacent face of said first face containing said first row of said circuit terminals, said second row of component terminals projecting from the respective adjacent face of said second row of said circuit terminals; and further comprising circuit terminals comprising a metal bar to which said circuit connection may be made;

at least one aperture within said component terminals through which a component lead passes;

a bus strap, said bus strap comprised of electrically conductive material and positioned upon said first face of said block;

a plurality of apertures contained within said bus strap, which allows said circuit terminals to pass through said bus strap without making electrical contact with said bus strap;

an indexing groove, wherein said bus strap is positioned inside said indexing groove, said groove being used to position and secure said bus strap to said block;

a bus terminal, said bus strap comprising at least one of said bus terminal, said bus terminal extending outward from body of said bus strap; said block also containing at least one notch, said bus terminal passing through said notch and connected to said component terminals; and

a bus insulator, said bus insulator constructed of electrically insulated material of the same size and shape of said bus strap, said bus insulator positioned between the faces of said bus strap, when a plurality of bus means are employed.

3,941,444

SEALING MEMBER

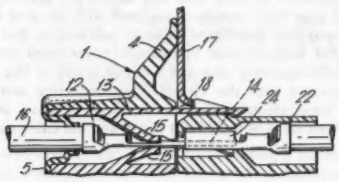
Aldo Bruni, and Luigi Campari, both of Turin, Italy, assignors to AMP Incorporated, Harrisburg, Pa.

Filed July 24, 1974, Ser. No. 491,184

Claims priority, application Italy, Aug. 1, 1973, 21999/73

Int. Cl.² H01R *7/02*

U.S. Cl. 339—60 M **1 Claim**



1. A sealing member of resilient, rubber-like material comprising a hollow body part open at one end for receiving an electrical component, at its opposite end, the hollow body part has a wall which is formed inwardly towards the interior of the body part to define on its outer surface at least one first recess which is generally cylindrical and which has a pair of diametrically opposed grooves extending substantially the length thereof, said first recess communicates with a relatively smaller generally cylindrical second recess coaxial with the first recess, the transition between the first and second recesses defining a shoulder, a base of the second recess being frangible to permit the passage of a flat tab contact terminating the end of a cylindrical conductor, through the wall, the conductor having a smaller outer periphery than that of the flat tab contact, the tearing of the base being limited to the material of the second recess which embraces sealingly the cylindrical conductor extending rearwardly from the flat tab contact through the wall.

3,941,445

ELECTRICAL CONNECTOR DEVICE

Guy Lacan, Carrieres-sous-Bois, France, assignor to La Telemecanique Electrique, Nanterre, France

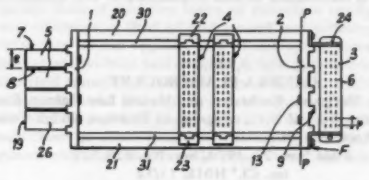
Filed Apr. 8, 1974, Ser. No. 458,955

Claims priority, application France, Apr. 16, 1973, 73.13809

Int. Cl.² H01R *13/54*

U.S. Cl. 339—64 M **5 Claims**

1. An electrical connection device for making connections between external conductors and a fixed chassis supporting a plurality of removable electrical circuits, said chassis having two parallel side faces and a rear face, the connection device comprising a plurality of interconnector members mounted at the rear face, at least one junction connector member mounted at one of the side faces, said junction connector and interconnector members being of similar construction and each having a front face and a rear face and being provided, at their rear face, with pins adapted to have wound thereonto the bared ends of conductors and, at their front face, with contact members, a plurality of removable plugs each having first and second faces perpendicular to the side faces of the chassis, said first and second faces being spaced apart by a



distance which substantially equals a multiple of the pitch of the contact members in the junction connector member, said removable plugs being adapted to receive the external conductors and having pins adapted to engage the contact members of the junction connector member.

3,941,446

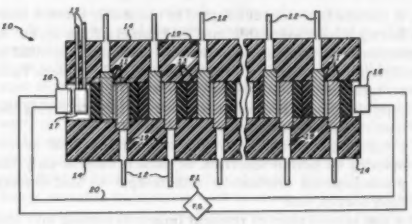
ELECTRICAL CONNECTOR

Joseph R. Cantwell, Dix Hills, N.Y., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Aug. 21, 1974, Ser. No. 499,243

Int. Cl.² H01R *13/54*

U.S. Cl. 339—75 M **4 Claims**



1. An electrical connector comprising:

a housing means made of electrical insulating material containing two mating parts,

a plurality of electrical conductors contained and arranged in each of said housing parts such that each conductor in one of said housing parts mates with a corresponding conductor in said other housing part, forming conductor pairs,

insulating means disposed between said conductor pairs,

means for connecting external circuits to said conductors through said housing,

two end plates, a first end plate and a second end plate, said first end plate located at one end of said housing and said second end plate located at the other end, said end plates including a rectangular block and a rectangular spring shaped to form a V, said spring attached to said block at the apex of the V, with said spring of said first end plate having at least one hole on one side of said apex,

a force transmission structure including two sets of rigid rods, a first set and a second set one end of each of said rods contained in said first set being attached to said spring of said second end plate, the other ends extending through said holes of said spring of said first end plate, said rods of said second set being attached at one end to said spring of said first end plate and at the other end to said spring of said second end plate, said second set attachments being on the opposite side of said apexes from said first set of attachments and said holes,

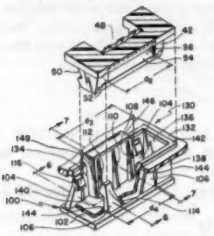
a force generating device including at least one cam shaped lever, and

means for connecting the ends of said first set of rods which extend through said holes of said spring of said first end plate to said cam shaped lever whereby movement of said lever in an appropriate direction applies an external force that is transmitted to said conductors of said conductor pairs.

3,941,447
CAMERA FLASH SOCKET

Jerry Lee Hargrave, Rochester, and Harold Lee Malone, East Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 29, 1974, Ser. No. 528,529
Int. Cl.² H01R 13/54
U.S. Cl. 339—91 R **7 Claims**



1. A camera flash socket adapted to releasably retain a flash unit having a base insertable into said camera flash socket in a predetermined orientation so that the flash unit is pointed in a predetermined direction with respect to said camera flash socket, said camera flash socket comprising:

a body defining a central access opening for receiving the base of such a flash unit;

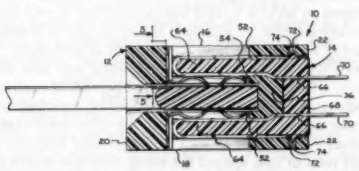
a projecting member extending into said central access opening to permit insertion of such a base in only the predetermined orientation with resepct to said camera flash socket; and

first and second pairs of resilient fingers extending into said central access opening and engageable with a base inserted in the predetermined orientation to releasably retain such a base in said camera flash socket, said first pair separated by a first distance and said second pair separated by a second distance, said first and second distances being different.

3,941,448
CONNECTOR BLOCK

Robert F. Evans, New Cumberland, Pa., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed July 29, 1974, Ser. No. 492,731
Int. Cl.² H05K 1/07
U.S. Cl. 339—176 MF **8 Claims**

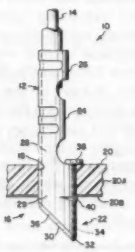


1. A connector block comprising a body having front and rear body members both formed of insulating material; the front body member having spaced front and rear faces, an elongate circuit board-receiving slot extending along the front face and into the front body member a distance from the front face, a circuit board nose surrounding said circuit board-receiving slot and facing away from said front face, the nose including a pair of side walls extending along the slot, and a plurality of contact-receiving openings extending through the thickness of the side walls at intervals along the length thereof; the rear body member including an elongate base extending along the end of the nose of the front body member when the members are assembled, a pair of spaced ribbon cable-receiving noses extending from said base toward the front surface and along the outer surfaces of said side walls, such noses including cable support surfaces overlying the openings in the adjacent side walls, and means for securing a flat cable on each such nose with exposed conductors in the cable on the respective cable support surfaces and facing the openings in the adjacent side walls; and a plurality of metal contacts each located in one of said openings, mounting means attached to each contact for securing the contact to the front body member, each contact including a surface facing toward the adjacent ribbon cable-receiving nose for engaging an exposed conductor in the cable on the adjacent ribbon cable-receiving nose and a circuit board pad engaging surface facing toward the circuit board-receiving slot for engaging a pad on a circuit board positioned in such slot; and means for securing said front and rear body members together with the end of the circuit board nose positioned adjacent said base so that when a flat cable with exposed conductors is mounted on each ribbon cable-receiving nose and a circuit board or like member is inserted into the circuit board-receiving slot, said contacts form electrical interconnections between contact pads on both sides of the circuit board and the cable conductors.

3,941,449
TERMINAL FOR APERTURED CIRCUIT PANEL

Bruno Baumanis, River Forest, Ill., assignor to Molex Incorporated, Lisle, Ill.

Filed Apr. 5, 1974, Ser. No. 458,070
Int. Cl.² H01R 9/08
U.S. Cl. 339—217 S **10 Claims**



1. A terminal for use with an apertured circuit panel comprising a conductive generally elongated sheet metal body including a nose portion for insertion into the panel apertured and a conductor engaging portion axially spaced from said nose portion, said nose portion comprising a cylindrical segment having a length in excess of the panel thickness and having a substantially constant circular cross section complementary to the aperture cross section, the part of the nose portion within the aperture when the terminal is inserted having a diameter not less than the diameter of the aperture, rear stop means on said body for limiting insertion of said nose portion into the aperture, forward stop means spaced from said rear stop means by a distance at least as great as the panel thickness for resisting withdrawal of said nose portion from the aperture after insertion, and the leading edge of said nose portion from the aperture after insertion, and the leading edge of said nose portion lying substantially in a plane slope relative

to the axis of said cylindrical segment and forming a bevelled tip of said nose portion facilitating entry of said nose portion into the panel aperture.

3,941,450
DEVICE FOR RECORDING A MATRIX OF HOLOGRAPHIC LENSES

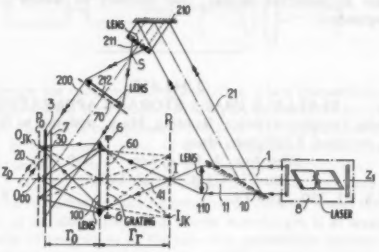
Erich Spitz; Jean Pierre Huignard, and Odile Royer, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed June 26, 1973, Ser. No. 373,781

Claims priority, application France, June 30, 1972, 72.23763

Int. Cl.² G02B *5/32*; **G03H** *1/16, 1/30*

U.S. Cl. 350—3.5 **7 Claims**



1. A device for simultaneously recording a matrix of holographic lenses, each of said lenses, when illuminated by a monochromatic parallel light beam of fixed direction, producing a reconstituted beam, the whole of said reconstituted beams thus produced illuminating a same common predetermined area, said device comprising:

a radiation source for emitting a beam of coherent light;

splitting means for splitting said beam into a first and a second beam;

optical collimating means for providing for said first beam a parallel beam;

diffracting means for providing from said second beam a plurality of diffracted beams;

a plate of photosensitive material for simultaneously receiving said parallel beam and said plurality of diffracted beams; said parallel beam illuminating in said plate an area at least equal to the area of said matrix; each said diffracted beam illuminating in said plate a distinct area, said distinct areas being arranged at the nodes of said matrix; and said parallel beam interfering in said plate with said plurality of diffracted beams for simultaneously generating said holographic lenses;

first optical projecting means, said first optical projecting means being arranged between said diffracting means and said plate for receiving the whole of the light diffracted by said diffracting means and focussing in the vicinity of said plate said plurality of diffracted beams; and

a first non-uniform transparency arranged in front of said plate, said first transparency being crossed by said parallel beam and by said plurality of diffracted beams so as to equalize the luminous intensities of said diffracted beams.

3,941,451
INLINE OPTICAL WEDGE STABILIZER

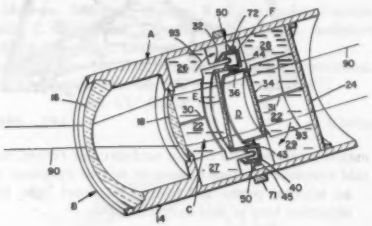
William Edwin Humphrey, Oakland, Calif., assignor to Optical Research and Development Corporation, Berkeley, Calif.

Filed Mar. 11, 1974, Ser. No. 449,869

Int. Cl.² G02B *23/02, 5/06*

U.S. Cl. 350—16 **6 Claims**

1. An optical stabilizer comprising: a chamber having at least one rigid transparent wall for admitting light to be stabilized into said chamber and at least one movable transparent wall; means for effecting a fluid-tight seal between said movable transparent wall and said chamber for permitting said chamber in the interior to confine between said transparent walls a transparent fluid of a first index of refraction separate and apart from a transparent fluid on the exterior of said chamber of a second and different index of refraction; a transparent fluid of said first index of refraction confined within said chamber; a fluid of said second and differing index of refraction on the opposite side of said freely movable transparent wall without said chamber; a light path defined through the rigid transparent wall, the first fluid, said freely movable transparent wall and said second transparent fluid; means for defining an enclosed pressure-sensitive diaphragm contacting said chamber at one boundary, contacting said movable transparent wall at another boundary and exposed to said first fluid



interior of said chamber, said means for defining a pressure-sensitive diaphragm having an area with respect to the area of said transparent wall whereby differences in pressure of said fluids acting on said movable transparent wall are equally and oppositely opposed by pressures in said diaphragm acting from said chamber to said movable transparent wall to render said movable transparent wall substantial freedom of movement independent of differing incremental static fluid pressures on said movable transparent wall; and means for biasing said movable transparent wall to a neutral position whereby upon accidental angular motion of said chamber the inertia of said fluid within said chamber dynamically acts upon said freely movable transparent wall to move said wall and generate an angularly inclined refractive wedge for the stabilization of light.

3,941,452
MICROSCOPES

Bernard I. Parker, Warren, and Charles W. Caldwell, Cortland, both of Ohio, assignors to Parco Scientific Inc., Warren, Ohio

Continuation of Ser. No. 95,287, Dec. 4, 1970, abandoned. This application Sept. 12, 1972, Ser. No. 288,371

Int. Cl.² G02B *21/26*

U.S. Cl. 350—82 **4 Claims**

1. A microscope comprising:

a base formed as a hollow inverted dished pyramidal member, said base being substantially triangular in plan and having a central upwardly extending tubular portion,

a bridge extending upwardly from said base and having three legs, each leg having its lower end fixedly connected to said base at a corner thereof, the upper portions of said legs being joined to a horizontally disposed boss having a central opening circular recess aligned with and spaced upwardly from said central tubular portion,

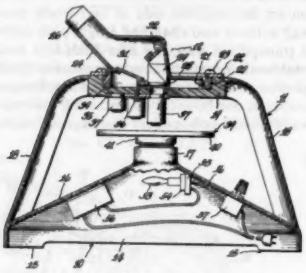
an objective lens mounted in a holder carried by the underside of said horizontally disposed boss,

a stage plate having a central depending externally threaded tubular portion engaging internal threads formed in said central tubular portion of said base to effect vertical adjustment of said stage plate by rotation thereof,

said depending tubular portion of said stage plate carrying condensing lens means aligned with said objective lens,

a light source mounted inside said base and supported from a wall thereof in alignment with said condensing lens means for illuminating a specimen on said stage plate,

an eyepiece housing extending upwardly from said bridge, said eyepiece housing having a ring at its lower portion which seats within said circular recess for rotation,



means retaining said ring in said circular recess, and,

said eyepiece housing having an angled eyepiece tube and an internal prism and mirror to direct light from said objective lens to said eyepiece tube.

3,941,453

BIREFRINGENT COMPOUNDS USED IN KERR CELLS

Uwe Kruger, Hamburg-Schenefeld, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 13, 1974, Ser. No. 523,329

Claims priority, application Germany, Nov. 15, 1973, 2357072

Int. Cl.² G02F 1/07

U.S. Cl. 350—150 **8 Claims**

1. A Kerr cell, characterized in that its electro-optically active liquid consists of molecules with a group X which attracts electrons and comprises π -electrons and a group R which is conjugated therewith and supplies electrons, of the formula

R—X

in which X = $-COCF_3$, $-COC_6H_5$ or $-SO_2CF_3$, n being 0 or 2, and R = phenyl or $(CH_3)_2N$.

3,941,454

DISPLAY DEVICE WITH ORIENTED LIQUID CRYSTALS

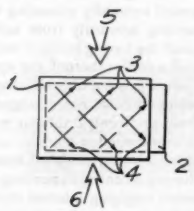
Shuji Maezawa, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Aug. 10, 1973, Ser. No. 387,430

Claims priority, application Japan, Aug. 16, 1972, 47-81440

Int. Cl.² G02F 1/13

U.S. Cl. 350—160 LC **3 Claims**



1. A liquid crystal display device, comprising a cell including a nematic liquid crystal material of positive dielectric anisotropy sandwiched between upper and lower transparent plate members, opposed surfaces of which have electrode means thereon for forming characters, a vector from the bottom to the top of any character constituting a reference direction, each of the opposed surfaces of said plate members having been rubbed in a single direction on its inner surface, said single directions being at an angle of approximately 90° to one another said reference direction and said rubbing directions being so related that, regarding said reference direction and said rubbing directions as vectors, the angle from said reference direction to said rubbing direction on said upper plate is approximately 45° and to said rubbing direction on said lower plate is approximately 135°, the angles between said reference direction and each of said rubbing directions being in the same rotational direction, whether clockwise or counterclockwise, and means to apply a voltage across said cell which is less than the saturation voltage and which generates a character display, the visibility of which is angle-dependent.

3,941,455

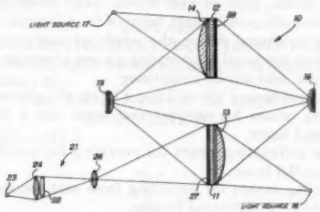
BI-STABLE IMAGE STORAGE APPARATUS

John Augustus O'Brien, Reading, Mass., assignor to Itek Corporation, Lexington, Mass.

Filed Nov. 4, 1974, Ser. No. 520,580

Int. Cl.² G11C 11/42; G02F 1/13

U.S. Cl. 350—160 LC **8 Claims**



1. Image storage apparatus comprising:

a. an image storage circuit for storing a desired radiation pattern, said image storage circuit including:

1. first and second image amplifier means, each of said first and second image amplifier means comprising inverting amplifier means for generating an output radiation pattern that is the negative of an input radiation pattern applied thereto;
2. first transfer means for directing the output radiation pattern of said first image amplifier means to said second image amplifier means to be the input radiation pattern thereof; and
3. second transfer means for directing the output radiation pattern of said second image amplifier means to said first image amplifier means to the input radiation pattern thereof; and

b. means for optically applying said desired radiation pattern to said circuit to be stored therein, said optical applying means comprising means for projecting said desired radiation pattern onto said first image amplifier means to be the input radiation pattern thereof; such that the output radiation pattern of said first image amplifier means will be the negative of said desired radiation pattern and the output radiation pattern of said second image amplifier means will be the positive of said desired radiation pattern.

3,941,456

DEVICE FOR REDUCING THE GRANULATION IN THE TRANSMISSION OF OPTICAL INFORMATION BY MEANS OF A HIGHLY COHERENT BEAM OF RADIATION

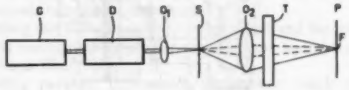
Wolfram Schilz, Norderstedt; Manfred Rahlff, Hamburg; Uwe Jurgen Schmidt, Pinneberg; Klaus Gottfried Plass, Hamburg, and Eckhard Schroder, Henstedt-Ulzburg, all of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 25, 1974, Ser. No. 454,308

Claims priority, application Germany, Mar. 29, 1973, 2315658

Int. Cl.² G02F 1/32; G02B 21/14

U.S. Cl. 350—161 **10 Claims**



1. A device for reducing the granulation when transmitting optical information with the aid of a highly coherent beam of radiation, wherein it comprises a radiation diffusing element disposed in the image plane of a first objective system, a second objective system behind the radiation diffusing element, and at least one radiation refracting element of a medium whose radiation refracting property is variable under the influence of an ultrasonic wave whose wavelength is at least of the order of magnitude of the size of a granulation element of the radiation beam at the location of the radiation refracting element.

3,941,457

SYMMETRICAL TYPE FOUR-COMPONENT LENS SYSTEM

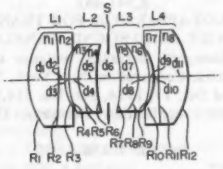
Tadashi Kawakami, Tokyo, Japan, assignor to Nippon Kogaku Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 4, 1974, Ser. No. 447,678

Claims priority, application Japan, Mar. 9, 1973, 48-27109

Int. Cl.² G02B 9/34

U.S. Cl. 350—220 **6 Claims**



1. A symmetrical type four-component lens system comprising, in the direction of incidence of light, a first positive meniscus lens component (L1), a second positive meniscus lens component (L2), a stop (S), a third positive meniscus lens component (L3) and a fourth positive meniscus lens component (L4), each of the lens components being a combination of a positive lens element and a negative lens element, the concave surfaces of each of the lens components facing the stop, the radii of curvature (R3 and R10) of the surfaces of the first and fourth components facing the stop being less than the radii of curvature (R4 and R9) of the surfaces of the second and third components facing away from the stop, the focal lengths of the first and fourth components being greater than the focal lengths of the second and third components, and the second and third components satisfying the following conditions:

$$[K_p - K_n \leq 0]$$

$$[\nu_p - \nu_n > 10]$$

$K_p - K_n$ is in the range of approximately −0.00392 to −0.00394, and $\nu_p - \nu_n$ is in the range of approximately 34.6 to 55.4, where, if n_E, n_C and $n_{C'}$ are the refractive indices of the lens-forming materials for light rays of wavelengths E (546.1mμ), G (435.8mμ) and C (656.3mμ), respectively, and if K is the value represented by $(n_E - n_{C'})/(n_C - n_{C'})$, then K_p is the sum of the K values of the materials forming the positive elements in the second and third components, ν_p is the sum of the Abbe numbers of the materials forming the positive elements in the second and third components, K_n is the sum of the K values of the materials forming the negative elements in the second and third components, and ν_n is the sum of the Abbe numbers of the materials forming the negative elements in the second and third components.

3,941,458

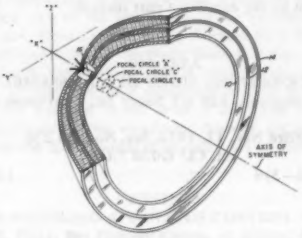
CATOPTRIC LENS ARRANGEMENT

Earle F. Merrow, Billerica; Werner R. Rambauske, Carlisle, and Philip J. McFarland, Lynnfield, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 375,563, July 2, 1973, abandoned. This application Jan. 20, 1975, Ser. No. 542,473

Int. Cl.² G02B 5/10

U.S. Cl. 350—294 **2 Claims**



1. A catoptric lens arrangement for directing wave propagated energy from an extended source thereof, the arrangement comprising:

a. at least a pair of divergent mirrors symmetrically disposed about an axis of symmetry to define a divergent channel for wave propagated energy, one mirror in each such pair having a convex reflecting surface and the other one having a concave reflecting surface, the generatrix of each one of such reflecting surfaces being a segment of a different parabola having a different focal point on a common principal axis spatially separated from the axis of symmetry and a different focal point, the generatrix of the convex reflecting surface being interposed between the divergent channel and the focal point of one of the reflecting surfaces; and

b. an extended source of wave propagated energy disposed between the at least one pair of divergent mirrors adjacent to the axis of symmetry and spaced from both focal points of the generating parabolas.

3,941,459

CATOPTRIC LENS ARRANGEMENT

Philip J. McFarland, Lynnfield, and Werner R. Rambauske, Carlisle, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 376,015, July 2, 1973, abandoned. This application Feb. 24, 1975, Ser. No. 552,096

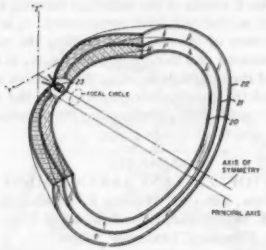
Int. Cl.² G02B 5/10; F21V 7/00

U.S. Cl. 350—294 **9 Claims**

1. A beam forming arrangement for forming a beam of wave propagated energy from the energy emitted by a source thereof, such arrangement comprising:

a. at least a pair of mirrors having a common focal curve disposed around an axis of symmetry, one of such mirrors having a concave reflecting surface and the other having

a convex reflecting surface to define a divergent channel for wave propagated energy, one of such mirrors being interposed between such channel and the common focal curve of such mirrors; and



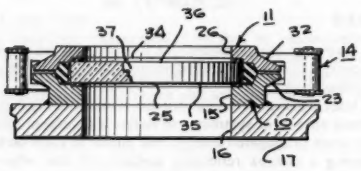
b. a source of wave propagated energy disposed between the confocal mirrors and within the divergent channel adjacent to the narrowest part thereof.

3,941,460

QUICK-OPENING SIGHT GLASS ASSEMBLY

Charles E. Meginnis, 529 1/2 Nancy St., Charleston, W. Va. 25302

Filed Nov. 12, 1974, Ser. No. 523,276
Int. Cl.[2] G02B *5/00*
U.S. Cl. 350—319 14 Claims



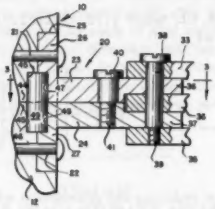
1. A sight glass assembly comprising a first housing section having an opening therethrough, mountable on a vessel wall having and opening communicating with a fluid contained therein so that said housing section opening registers with said vessel wall opening, said first housing section having an enlarged section including a lens seating surface and a packing bearing surface, said packing bearing surface being inclined relative to a longitudinal center line of said first housing section opening, a second housing section having an opening therethrough registered with said first housing section opening, said second housing section opening having an enlarged section including a lens seating surface and a packing bearing surface, said packing bearing surface being inclined relative to said longitudinal center line, said lens seating and packing bearing surfaces of the enlarged opening section of said second housing section being disposed in opposed relation to the lens seating and packing bearing surfaces of the enlarged opening section of said first housing section, a lens disposed in said housing openings, interposed between said seating surfaces, a packing member disposed in said enlarged opening sections, said packing member engaging said bearing surfaces and a periphery of said lens and means for urging said packing bearing surfaces together whereby said packing is caused to expand laterally to place said lens in lateral compression and to provide a fluid tight seal between said housing sections and the periphery of said lens.

3,941,461

HINGE ATTACHED TO THE SPLIT ENDS MEANS FOR ALIGNING AN EYEGLASS FRAME AT THE SPLIT ENDS THEREOF AND ALSO THE FRONT

Raymond E. Lambert, North Attleboro, Mass., assignor to Lambert Anodizing Co., Inc., Attleboro, Mass.

Filed Sept. 3, 1974, Ser. No. 502,343
Int. Cl.[2] G02C *1/08, 5/22*
U.S. Cl. 351—95 1 Claim



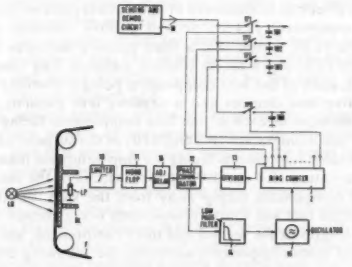
1. In combination a spectacle frame front having a substantially flat rear face portion at the outer edges thereof remote from the central nasal portion, first recess means in each of the temporal portions of said rear face portion, said temporal portion having a split therethrough and through the first recess means, each of the temporal portions thereof extending from an outer edge to a lens opening defining an upper temporal rear face portion and a lower temporal rear face portion, front hinge means having a base received in each of said first recess means, said front hinge means comprising two parts with one part secured to a respective upper face portion and the other part secured to a respective lower face portion, a second recess formed within each of said first recesses, an aligning pin means in each of said second recess means, the base of each respective front hinge means having a cavity formed therein, said pin received in the second recess means and cavity whereby alignment of the base in the first recess means is achieved.

3,941,462

METHOD AND APPARATUS FOR TRANSFERRING WIDE-BAND SOUND SIGNALS

Hans Reiber, Stuttgart, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Oct. 15, 1974, Ser. No. 514,861
Claims priority, application Germany, Oct. 17, 1973, 2352124
Int. Cl.[2] G03B *31/00*
U.S. Cl. 352—12 15 Claims



1. A method for providing synchronization, in a system for transferring wide-band sound signals of the type wherein at the input end of the system the sound signal is divided into a lower and a higher frequency range, the signal of the lower

frequency range is transferred directly while the signal of the higher frequency range is divided into partial higher frequency ranges, the amplitude of each of said partial higher frequency ranges being detected and used to sequentially modulate a single subcarrier frequency which is thereafter transferred to a reproducing end where the subcarrier frequency is demodulated to obtain the amplitude information of each partial high frequency range said sequential amplitude information being separated by a time selection operating electronic switch said amplitude information being used to modulate an equivalent signal lying approximately in the center of the individual partial high frequency ranges, said modulated equivalent sound signal being added to the directly transferred lower frequency range signal for reproduction of the wide-band sound signal, comprising the steps of:

recording the lower frequency range signal and the sequentially modulated subcarrier signal on the sound track of a sound film;

providing periodic information on another track of the sound film;

detecting the periodic information at the reproducing end; and

synchronizing said electronic time selection switch with said periodic information at the reproducing end, so that the amplitude information of each partial high frequency range is provided to the proper equivalent sound signal.

3,941,463

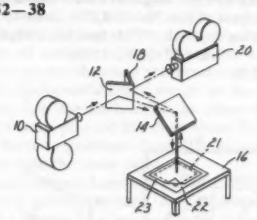
METHOD OF PRODUCING A COLORED FILM FROM A BLACK-AND-WHITE PICTURE

Wilfred W. Wetzel, and Ralph M. Darr, both of St. Paul, Minn., assignors to Deloy J. White, Mexico City, Mexico

Filed Aug. 26, 1968, Ser. No. 755,051

Int. Cl.² G03C *11/18*

U.S. Cl. 352—38 **8 Claims**



1. The method of converting a black-and-white picture to a colored film, comprising:

1. projecting a black-and-white image of the black-and-white picture onto a surface;

2. applying color to said surface at selected areas of the projected black-and-white image to provide an opaque composite of applied color and superimposed black-and-white image; and

3. while maintaining the projection of the black-and-white image on said surface, photographing with color-sensitive film the composite on the surface.

3,941,464

MINIATURE MOTION PICTURE CAMERA

Heinz Waaske, Mascherode, Germany, assignor to Rollei-Werke Franke & Heidecke, Braunschweig, Germany

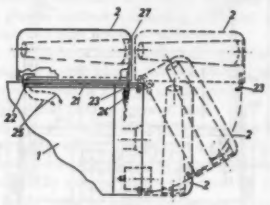
Filed Oct. 9, 1974, Ser. No. 513,499

Claims priority, application Germany, Oct. 13, 1973, 2351464

Int. Cl.² G03B *23/02*

U.S. Cl. 352—72 **7 Claims**

1. A miniature motion picture camera comprising a body housing adapted to contain a film cassette, said body housing having a front and having a lens defining an optical axis, a viewfinder housing having a reversed Galileo optical system viewfinder therein, said viewfinder having an optical axis, and means for mounting said viewfinder housing on said body housing selectively in either one of two positions, in the first of which positions said viewfinder housing is mounted on said body housing with the optical axis of the viewfinder substantially parallel to the optical axis of the lens, so that said viewfinder may serve effectively as a viewfinder for taking pictures through said lens, in the second of which positions said viewfinder housing is mounted on the front of said body housing



with the optical axis of the viewfinder extending transverse to the optical axis of the lens and with the viewfinder housing serving as a front protective cap for said body housing, the width and length of said viewfinder housing being substantially identical with the width and height, respectively, of said body housing, so that when said viewfinder housing is mounted in said second position on the front of said body housing, the lateral surfaces of the viewfinder housing are substantially flush with the lateral surfaces of said body housing.

3,941,465

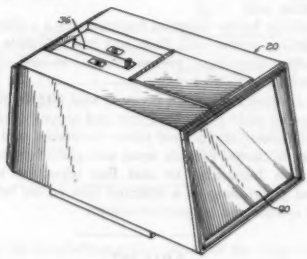
FILM HANDLING APPARATUS CONTROL SYSTEM

Erwin E. Figge, Des Plaines; Kenyon A. Hapke, Libertyville; George C. Karalus, Arlington Heights, and Robert C. Lenell, Chicago, all of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed June 28, 1973, Ser. No. 374,284

Int. Cl.² G03C *11/00*

U.S. Cl. 352—130 **24 Claims**



1. A control system for apparatus adapted for handling film maintained on supply and take-up reels contained within a cassette, said control system comprising:

function programming means for programming the sequence and execution of plural operation modes of said apparatus, said function programming means including a central logic control means having a plurality of logic positions and stepping means for advancing said logic unit unidirectionally from one logic position to another;

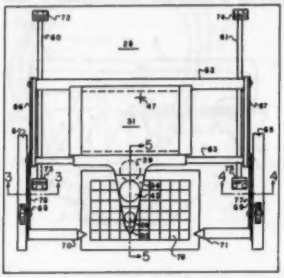
reel drive control means having plural drive control modes adapted to be programmed by said function programmer; and

mode change actuator means responsive to cessation of film movement to actuate said stepping means for changing the logic position of said central logic control means.

3,941,466
VERNIER CARRIAGE CONTROL

Rashmikant P. Shah, Hartford, Wis., assignor to Bell & Howell Company, Chicago, Ill.

Filed Apr. 23, 1975, Ser. No. 571,034
Int. Cl.² G03B *23/08*
U.S. Cl. 353—27 R **8 Claims**



1. In an ultrafiche reader apparatus of the type which includes a light system and a projection system for projecting a magnified image of a selected one of a plurality of ultrafiche film frames onto a reference surface, an improved ultrafiche carriage assembly for positioning a desired one of said film frames between the light system and projection system comprising:

a pair of spaced apart and substantially parallel glide members;

first and second spaced apart and substantially parallel glide bars extending across said pair of glide members and transverse to said glide members, said second glide bar including a rack on a portion of at least one side thereof;

a friction surface extending alongside of each of said glide members;

first and second side supports for coupling said first and second glide bars together in fixed spaced apart relation, each of said first and second side supports including a rotatable wheel communicating with one of said friction surfaces; and

an ultrafiche holder adapted for receiving an ultrafiche and extending across said first and second glide bars and including a rotatable pinion coupled to said rack of said second glide bar, whereby

as said friction wheels are rotated, said ultrafiche holder is caused to glide along said first and second members in a first direction and as said pinion is rotated said ultrafiche holder is caused to glide upon said glide bars in a second direction transverse to said first direction to thereby afford positioning of a selected film frame between the light system and projection system.

3,941,467
OPTICAL PROJECTOR/READER

Narinder S. Kapany, Woodside, and Fred C. Unterleitner, Palo Alto, both of Calif., assignors to Kaptron, Inc., Palo Alto, Calif.

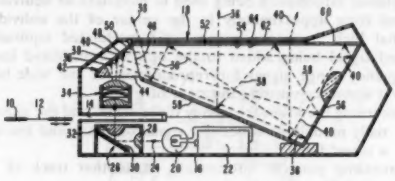
Filed Oct. 29, 1074, Ser. No. 518,254
Int. Cl.² G03B *21/10*
U.S. Cl. 353—34 **9 Claims**

1. Viewing apparatus comprising:

prism means for magnifying a light image passing through it,

means for projecting a diverging light beam image through the prism means,

viewing screen means for displaying light projected through the prism means onto the viewing screen means, the prism means including a prism having an index of refraction n_1, a transparent entrant surface, a flat transparent exit surface facing the viewing screen means, a light transmitting medium having an index of refraction n_2 interposed between the viewing screen means and the exit surface, where $n_2 < n_1$, a first reflecting surface opposite to the entrant surface and forming a predetermined, acute angle with the exit surface such that a major portion of the light beam passing through the entrant surface is reflected by the first reflecting surface to the exit surface at an incident angle greater than the critical angle $\sin^{-1} n_2/n_1$



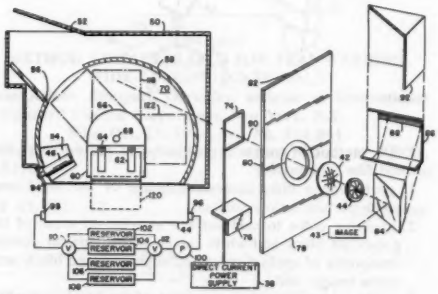
for total internal reflection by the exit surface, and a second reflecting surface angularly facing the exit surface for returning the light beam reflected internally by the exit surface back to the exit surface at an incident angle which is less than the critical angle $\sin^{-1} n_2/n_1$

such that the returned light beam passes through the exit surface to impinge on the viewing screen means.

3,941,468
IDENTIFICATION STRUCTURE, MEANS FOR, AND METHOD OF PRODUCTION

Thomas J. McVittie, Bloomfield Hills, Mich., assignor to Marlin & Company Systems Engineers Inc., Clawson, Mich.

Continuation-in-part of Ser. No. 150,381, June 7, 1971. This application Sept. 18, 1973, Ser. No. 398,424
Int. Cl.² G03G *15/00*
U.S. Cl. 355—3 R **3 Claims**



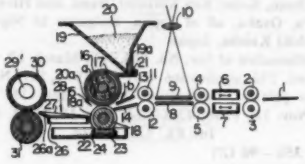
1. Structure for producing identification cards or the like having electrostatically deposited images thereon including means for receiving an identification card and for rotating the card in a vertically oriented circle, means operably associated with the means for receiving and rotating the card for electrostatically charging the card adjacent the top of the vertically oriented circle, means for producing an electrostatic image on the charged card, means carrying an image-setting solution including particles therein having an affinity for the charged card positioned to receive the charged card having the electrostatic image thereon at the bottom of the vertically oriented circle through which the card is moved, means for passing image-setting solution over the card at the lowermost portion of the circle and means for subsequently drying the card on movement of the card toward the position in which it was received.

3,941,469

DRY TYPE DEVELOPING DEVICE FOR A COPYING APPARATUS OR LIKE APPARATUS

Toyoo Okamoto, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Apr. 23, 1974, Ser. No. 463,365
Claims priority, application Japan, May 1, 1973, 48-49481
Int. Cl.² G03G 15/00
U.S. Cl. 355—3 DD 6 Claims



1. A dry type developing apparatus or like apparatus wherein an electrostatic latent image formed on a copy sheet is developed into a visible image by means of a magnetic brush technique, comprising in combination:

a toner supply member;

means for magnetically forming on the surface of said supply member a toner layer functioning as a magnetic brush;

means for maintaining said toner layer at a predetermined height;

means for continuously moving said magnetic brush through a developing station;

receiver means of a non-magnetic material disposed in spaced juxtaposed relation to said toner supply member and having a surface for receiving a copy sheet moving into the developing station and spaced apart from said surface of said toner supply member a predetermined distance greater than said predetermined height for bringing the electrostatic latent image on the copy sheet into contact with the surface of the toner layer in such a manner as to prevent the copy sheet from invading the toner layer or portions thereof from being kept out of contact with the toner layer; and

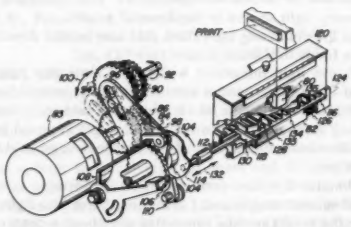
guide means disposed on the upstream side of said receiver means for guiding the copy sheet onto said surface of said receiver means in a manner such that the copy sheet forms an acute angle with said receiver means.

3,941,470

TONER PARTICLE DISPENSER

Naginchand A. Shah, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed June 17, 1974, Ser. No. 479,706
Int. Cl.² G03G 15/08
U.S. Cl. 355—3 DD 6 Claims



1. An electrostatographic printing machine of the type having an electrostatic latent image of an original document being reproduced recorded on an insulating medium, wherein the improvement includes:

a housing member defining a chamber for storing a developer mix comprising carrier granules and toner particles;

means for vibrating said housing member at predetermined intervals of time;

a dispensing member mounted on said housing member and having a plurality of apertures therein arranged to permit toner particles to pass therethrough;

at least one blade member operatively associated with said dispensing member, said blade member having a generally planar surface extending into the supply of toner particles in said housing member;

means for reciprocating said blade member in a direction transverse to the planar surface thereof so that said blade member forms a groove in the particles preventing the bridging and caking thereof; and

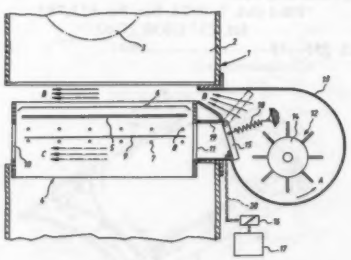
at least one stop member operatively associated with said dispensing member and having a generally planar surface extending into the supply of toner particles in a direction substantially normal to the direction of reciprocation of said blade member, said stop member remaining substantially stationary as said blade member reciprocates to prevent the movement of the toner particles therewith.

3,941,471

ELECTROPHOTOGRAPHIC COPIER WITH SAFETY ARRANGEMENT FOR PREVENTING DAMAGE TO COPYING MATERIAL IN FIXING ARRANGEMENT DURING COPIER MALFUNCTION

Günther Schatka, Pfaffenhofen; Wilm Krüger, Puchheim-Bahnhof; Rudolf Paulus, Munich; Boris Koleff, Munich; Erich Pattis, Munich, and Karl Hartwig, Unterhaching, all of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed Nov. 8, 1974, Ser. No. 522,217
Claims priority, application Germany, Nov. 12, 1973, 2356404
Int. Cl.² G03G 15/00
U.S. Cl. 355—3 R 10 Claims



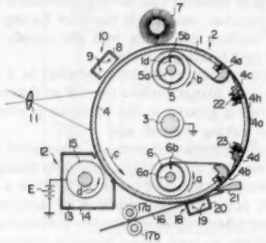
1. In an electrophotographic copier of the type comprised of a fixing arrangement for the heat-treatment of copying material by means of a heating device and a blower operative for keeping the heat of said fixing arrangement away from heat-sensitive components of the copier, in particular the copying drum, by establishing a flow of cooling air travelling along a first predetermined flow path, a safety arrangement comprising, in combination, diverting means activatable for diverting at least part of the flow of cooling air established by said blower away from said first flow path and into a second flow path leading through the interior of said fixing arrangement to effect cooling of the interior of said fixing arrangement; detecting means for detecting copier malfunction; and control means connected to said diverting means and said detecting means and operative in response to detection by said detecting means of copier malfunction for activating said diverting means.

3,941,472

PHOTOSENSITIVE DRUM FOR ELECTROPHOTOGRAPHIC COPYING MACHINES

Yasumori Nagahara, Yokosuka, and Kohji Suzuki, Yokohama, both of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Aug. 17, 1973, Ser. No. 389,226
Claims priority, application Japan, Aug. 21, 1972, 47-83531
Int. Cl.² G03G 15/22
U.S. Cl. 355—16 7 Claims



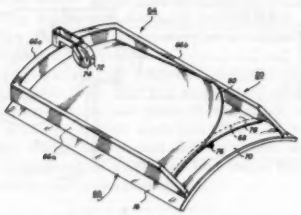
1. An electrophotographic copying machine having a rotatable drum, with a major portion of the circumference of the drum comprising a photoreceptor and at least a substantial portion of the remaining minor portion of the circumference of the drum comprising an electrically insulating layer, and including a cleaning brush engaging frictionally the circumference of the drum as the drum rotates, wherein said electrically insulating material is made of a substance which is not electrically charged to a polarity opposite a selected polarity by said frictional engagement with the cleaning brush during rotation of the drum.

3,941,473

MANUAL ASSIST DOCUMENT FEEDER

William L. Goffe, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 7, 1974, Ser. No. 512,783
Int. Cl.² G03B 27/62
U.S. Cl. 355—75 8 Claims



1. An apparatus for assisting in the manual placement of successive original documents onto the platen of a reproducing machine, including:

a housing member having an open ended compartment for holding a plurality of original documents therein, said housing member being positioned on the platen and arranged to locate the lowermost original document in position to be reproduced;

a plate member extending outwardly across the width of the open end of the compartment in said housing member and adapted to facilitate the removal of the lowermost original document therefrom; and

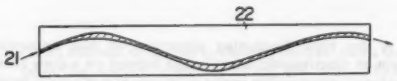
a roller mounted in the compartment of said housing member and contacting the uppermost original document therein, said roller being rotatable in one direction to facilitate the insertion of original documents in the compartment of said housing member and being non-rotatable in the opposed direction to frictionally prevent the movement of the uppermost original document during the removal of the lowermost original document from said housing member.

3,941,474

LIGHT-CONDUCTING GLASS STRUCTURES

Ichiro Kitano, Kobe; Ken Koizumi, Itami, and Hiroyoshi Matsumura, Osaka, all of Japan, assignors to Nippon Selfoc Kabushiki Kaisha, Japan

Continuation of Ser. No. 806,368, March 12, 1969, abandoned. This application May 26, 1971, Ser. No. 147,256
Claims priority, application Japan, Mar. 15, 1968, 43-16986; Nov. 18, 1968, 43-84724; Nov. 18, 1968, 43-84725
Int. Cl.² G02B 5/14
U.S. Cl. 350—96 GN 11 Claims



1. A glass structure for conducting light comprising: a glass body having a center axis and having an entrance surface and an exit surface both transverse to said center axis and a side surface surrounding said center axis; said glass body including therein SiO_2, thallium oxide and an alkali metal oxide having relative concentrations such that the concentration of cations which constitute said SiO_2 is substantially uniform in each planar cross-section perpendicular to said center axis the concentration in said cross-section of thallium ions which constitute said thallium oxide decreases continuously from said center axis toward said side surface, and the concentration in said cross-section of alkali metal ions which constitutes said alkali metal oxide increases continuously from said center axis toward said side surface; the variations in concentrations of said thallium ions and of said alkali metal ions effectively creating within the glass structure a refractive index gradient wherein, in said cross-section, the refractive index decreases continuously substantially in proportion to the square of the radial distance from said center axis, whereby light rays applied to said entrance surface are transmitted within the glass structure to said exit surface with repetition of refraction and without reflection and substantially without loss and without lagging phase velocities.

3,941,475

OPTICAL MICROCIRCUIT PRINTING SYSTEM

Ronald E. Sheets, Westminster, Calif., assignor to Tamarack Scientific Co., Inc., Orange, Calif.

Filed July 1, 1974, Ser. No. 484,564
Int. Cl.² G03B 27/16
U.S. Cl. 355—78 9 Claims

1. In an illumination system for exposing a photosensitive target surface to ultraviolet light,

a primary light source in the form of an arc,

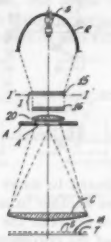
means for collecting light from said source and directing it to a focus in a focal plane,

a fly's eye light integrator with a first lenticular matrix in said focal plane, and a second lenticular matrix just beyond said focal plane, the lenticules of said second matrix being arranged to form magnified, superimposed images of illuminated lenticules of the first matrix on said target surface,

a collimator lens for receiving the image forming rays from said second matrix and collimating them into light striking the target surface symmetrically about a center optic axis perpendicular thereto,

aperture plate means located in proximity to the light integrator having an aperture therein which acts as a second-

ary source of the light emerging from the light integrator, and which controls the half angle of collimation of the beam of light emitted by the collimator lens,



means for regulating said aperture to adjust the half angle of collimation of said beam, and

a diffraction slit mask immediately in front of said target surface.

3,941,476

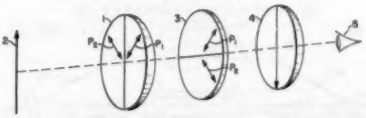
FOCUS SYSTEM

Norman L. Stauffer, Engelwood, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sept. 5, 1974, Ser. No. 503,451

Int. Cl.² G01C *3/12*

U.S. Cl. 356—3 **4 Claims**



2. An optical focus system comprising a lens adapted to be sighted upon an object, said lens being divided equally in a first direction and each half thereof covered by polarizing elements arranged at right angles to each other, a flat light transmission analyzer at the vicinity of the focal plane of said lens dividing the field of view of said lens in a second direction displaced substantially 90° with respect to said first direction, each half of said analyzer being covered by polarizing elements arranged at right angles to each other, means to permit relative movement of said lens and said analyzer along the optical axis of said lens, and means to observe said field of view.

3,941,477

MEASURING DEVICE FOR THE MEASUREMENT OF FLUID FLOW RATES

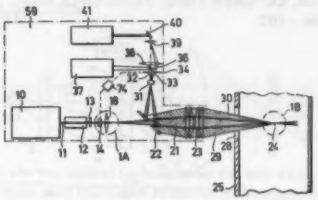
Richard Schodl, Proz-Urbach, Germany, assignor to Deutsche Forschungs-und Versuchsanstalt fur Luft-und Raumfahrt E.V., Porz-Wahn, Germany

Filed Nov. 25, 1974, Ser. No. 527,077

Int. Cl.² G01N *21/30*; G01P *3/36*

U.S. Cl. 356—28 **14 Claims**

1. Measuring device for the measurement of flow rates of fluids by determining the rate of movement of optically detectable particles present in the fluid flow, said device comprising a light source means for emitting a focussed beam, a beam splitter for receiving said beam and dividing said beam into two generated partial beams, a first lens system in the path of said partial beams for focussing the two partial beams in a fluid test volume at closely adjacent focussing points, a photoelectric converter system, a second lens system for directing light beams reflecting from particles in the test fluid to said photoelectric converter system, means for rotating said beam splitter to selectively change the direction of an imaginary straight line passing through said two focussing points, said photoelectric converter system including two photoelectric converters, said second lens system having means for imaging light beams reflected from particles at said two focus-



sing points separately on respective ones of said photoelectric converters, said second lens system including a dual hole diaphragm for receiving reflected light beams from said two focussing points, and means for adjusting said diaphragm simultaneously with the rotation of said beam splitter.

3,941,478

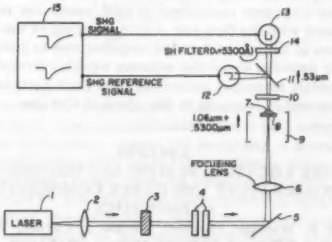
SECOND HARMONIC ANALYZER

Joseph Patrick Dougherty, Ossining; Stewart K. Kurtz, Yorktown Heights, and Robert John Seymour, Ossining, all of N.Y., assignors to North American Philips Corporation, New York, N.Y.

Filed Mar. 24, 1975, Ser. No. 555,199

Int. Cl.² G01N *21/00*

U.S. Cl. 356—30 **10 Claims**



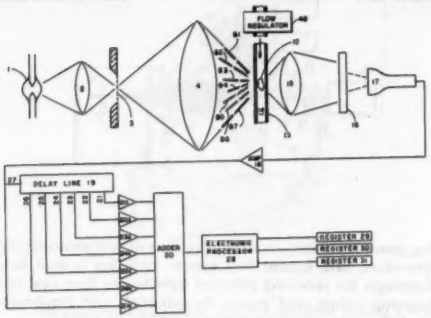
6. A device for determining crystallographic acentricities in a powder sample comprising a source of coherent radiation of a given fundamental wave-length and intensity, means to position the sample in the path of said radiation to expose the sample thereto, means to remove the fundamental after passage through the sample leaving essentially only a second harmonic of the fundamental, means to divide the beam after the sample into two beams, a narrow pass filter in the path of one of the beams to limit the frequency in said beam to substantially only the second harmonic, means to balance the intensities of the two beams at the second harmonic frequency, means in the path of each of said divided beams to detect the intensity thereof, and means to display the relative intensities of said beams to thereby determine acentricities in the sample.

3,941,479

USE OF MODULATED STIMULUS TO IMPROVE DETECTION SENSITIVITY FOR SIGNALS FROM PARTICLES IN A FLOW CHAMBER

Frank R. Whitehead, Arlington Heights, Ill., assignor to G. D. Searle & Co., Skokie, Ill.

Filed Sept. 26, 1974, Ser. No. 509,360
Int. Cl.² G01N 15/02, 33/16; G01J 3/46
U.S. Cl. 356—102 13 Claims



1. An apparatus for distinguishing between discrete particles of different materials entrained in a fluid which exhibit distinguishable responses to physical stimulus comprising a narrow channel through which fluid containing entrained particles of material flows, flow regulation means for maintaining a predetermined flow rate through said channel, means for exerting an aperiodic spatially discontinuous physical stimulus pattern at positions longitudinally spaced at predetermined intervals along said channel on said particles of material entrained in said fluid to elicit separate responses from each particle of material at each of the aforesaid positions which responses collectively comprise a coded response, transducer means for detecting the separate stimulus responses from said discrete particles of material at each of the aforesaid positions and for generating corresponding signals, decoding means comprising a matched filter for the aforesaid stimulus responses connected to said transducer means and correlated with the flow rate and the spacing of the aforesaid positions to decode said coded response and to combine into a single decoded signal the separate signals corresponding to the separate responses emanating from each particle of material detected in response to the physical stimulus.

3,941,480

WORK LOCATING SYSTEM AND METHOD WITH TEMPERATURE AND OTHER COMPENSATION CAPABILITIES

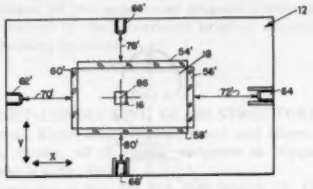
Ronald B. Webster, Melrose; Vincent J. Carulli, Warehouse Point, and Kenneth O. Wood, Hebron, all of Conn., assignors to The Gerber Scientific Instrument Company, South Windsor, Conn.

Filed Feb. 8, 1974, Ser. No. 440,740
Int. Cl.² G01B 9/02, 11/26
U.S. Cl. 356—106 R 23 Claims

19. A work position measuring apparatus for moving a work tool and a work member worked upon by the tool relative to one another in a direction perpendicular to an axis of the tool extending toward the work member in accordance with a work program comprising:

first measuring means located along a coordinate axis parallel to said direction perpendicular to the tool axis for measuring the distance or change of distance between the tool and a first edge of the work member along the coordinate axis;

second measuring means located along the coordinate axis for measuring the distance or change of distance along the coordinate axis between the tool and a second edge of the work member at the opposite side of the tool axis from the first edge; and



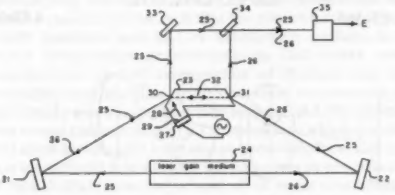
control means connected to move the work member and tool relative to one another to maintain the ratio of the measured distances between the tool and the edges the same as the ratio of the corresponding distances defined by the work program.

3,941,481

RING LASER HAVING ELASTIC WAVE BIAS

Charles John Kramer, 84 Deer Creek Road, Pittsford, N.Y. 14534

Filed Mar. 15, 1974, Ser. No. 451,765
Int. Cl.² G01B 9/02
U.S. Cl. 356—106 LR 10 Claims



1. A ring laser comprising, in combination,

first means providing a closed optical path;

second means for providing two laser beams traversing said path coincidently and simultaneously, but in opposing directions;

third means providing bias of the frequencies of the beams for preventing said beams from becoming coupled together;

said third means including an element of elastic material through which said path passes, wherein particles of said material define part of said path; and force generating means for causing said particles periodically to move elastically in one of said directions, substantially in phase, for increasing the frequency of one of said beams and decreasing the frequency of the other of said beams, by virtue of Fresnel drag.

3,941,482

METHOD OF TESTING ALKALI HALIDE CRYSTALS WITH ANISOTROPIC CENTERS

Irwin Schneider, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

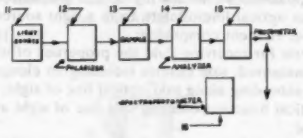
Filed Feb. 25, 1975, Ser. No. 552,906
Int. Cl.² G01J 4/00
U.S. Cl. 356—114 5 Claims

1. A method for testing alkali halide crystals with anisotropic centers for performance as holographic storage media and for optimum operating parameters which comprises:

passing linearly polarized light of known wavelength through an alkali halide crystal with aligned anisotropic centers so that polarization of said light is linearly polar-

ized at 45° with respect to the alignment direction of said anisotropic centers;

analyzing said light upon exit from said crystal now ellipically polarized in order to determine the maximum and minimum intensities, the angle between the minimum intensity and the direction perpendicular to the alignment axis, and the intensities of said exited light with polariza-



tion parallel and perpendicular to the alignment of said anisotropic centers, and the optical density of said crystal for light linearly polarized parallel and perpendicular to the optical axis of said aligned anisotropic centers;

repeating said analysis of said light for different wavelengths of said light; and

calculating the maximum diffraction efficiency for each of said analyses.

3,941,483

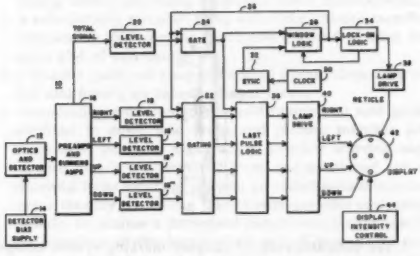
TARGET IDENTIFICATION APPARATUS

Frank J. Ferrin, Wayzata, Hennepin, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 8, 1974, Ser. No. 458,602

Int. Cl.² G01C *3/08*; **G02B** *13/06*

U.S. Cl. 356—152 **10 Claims**



1. In target acquisition apparatus of the type having a direction sensitive detector for producing electrical signals in response to periodic electromagnetic pulse signals of known repetition rate and duration arriving from a target within a field of view and indicator means for providing an indication when the detector is directed so that the target is located within a predetermined area of the field of view, improved discrimination circuitry comprising:

gating means for passing the electrical signals from said direction sensitive detector to said indicator means only during windows defined by periodic gating signals;

clock means for producing periodic gating signals having substantially the same repetition rate as the electromagnetic pulses and each having a duration greater than the duration of the electromagnetic pulses;

means for supplying the gating signals from said clock means to said gating means; and

synchronization circuitry for varying the time of occurrence of said windows so that the electrical signals corresponding to the electromagnetic pulses occur during a specified portion of the windows.

3,941,484

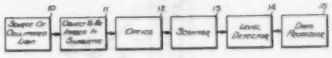
NON-CONTACT DIMENSIONAL MEASUREMENT TECHNIQUE

Marc G. Dreyfus, Stamford, Conn., assignor to BAI Corporation, Stamford, Conn.

Filed Oct. 31, 1974, Ser. No. 519,766

Int. Cl.² G01B *11/02*, *9/02*

U.S. Cl. 356—156 **11 Claims**



1. An electro-optical technique for the non-contact gauging of an object, said technique comprising the steps of illuminating the object with a low-divergence light beam acting to silhouette the object to produce an image thereof whose outline is defined by a Fresnel diffraction.

3,941,485

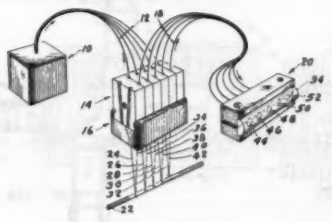
DEVICE FOR CONTINUOUSLY MEASURING A DIMENSION OF A WORKPIECE BY REFLECTED LIGHT

Richard A. Madden, Meetinghouse Lane, Little Compton, R.I. 02837

Filed Nov. 8, 1973, Ser. No. 413,962

Int. Cl.² G01B *11/04*, *11/10*

U.S. Cl. 356—159 **7 Claims**



1. Apparatus for continuously measuring a narrow workpiece in motion along a pre-determined linear path comprising a common light source, means for projecting a plurality of light beams toward points spaced longitudinally along and at varying distances laterally from the center of the path, visual display means for exhibiting a plurality of discrete light beams reflected from the work-piece, means for conducting light from the light source to the means for projecting each light beam and means for directing reflected light from the workpiece to the visual display means whereby the width of the work-piece is determined in steps by the number of light beams appearing at the visual display means.

3,941,486

WIRE BONDER

Arthur W. Tyler, Kowloon, Hong Kong, assignor to The Computervision Corporation, Bedford, Mass.

Filed June 3, 1974, Ser. No. 475,961

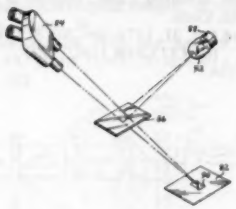
Int. Cl.² G01B *11/27*

U.S. Cl. 356—172 **11 Claims**

1. An optical positioning apparatus for a tool which is movable along a path with respect to the surface of a workpiece, said optical positioning system comprising:

means for generating a virtual image of a straight line reference pattern superimposed on the surface of the workpiece, said virtual image being perpendicular to the sur-

face of the workpiece; and, means for maintaining a predetermined physical relationship between the movement path of the tool and the virtual image generated by said image generating means.



3,941,487

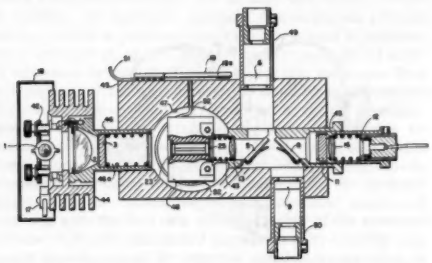
COLORIMETRIC FLUID ANALYZER

Robert J. Ehret, Los Altos; Donald E. Stephens, Palo Alto; Douglas H. Durland, Palo Alto, and Thomas D. Sharples, Atherton, all of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Continuation of Ser. No. 351,431, April 16, 1973, abandoned. This application Oct. 18, 1974, Ser. No. 516,008

Int. Cl.[2] G01J *3/46*; **G01N** *21/28, 1/10*

U.S. Cl. 356—181 **20 Claims**



1. A colorimeter responsive to color properties of a fluid comprising:

a cuvette;

means for flowing a fluid through the cuvette and projecting a light beam through the cuvette and the fluid to be analyzed along a first path;

detector means responsive to the energy of the light beam;

converting means comprising logarithmic amplifier means connected to said detector means;

a first dichroic beam separator interposed after said cuvette in said first path for deflecting light below a first selected wavelength in a second beam along a second path and transmitting light above said selected wavelength along said first path;

a second dichroic beam separator interposed after said first beam separator in said first path for deflecting light below a second selected wavelength in a third beam along a third path and transmitting the remaining light above said second selected wavelength along said first path;

the detector means comprising detectors interposed in each of said first, second and third paths responsive to the energy of the light beams therein for producing first, second, and third electrical output signals corresponding to the intensity of the energy of light in said first, second and third paths; and

said converting means being connected to receive said signals from said first and third detectors and from said first and second detectors, said converting means comprising logarithmic operational amplifiers whereby the signals representing transmittance of light are converted into signals proportional to absorbance at the wavelengths in question to produce electrical output signals representative of the difference of the optical absorbances within said cuvette of light between said third beam and said first beam and of the optical absorbances within said cuvette of light between said second beam and said first beam.

18. Apparatus for measuring optical properties of a fluid having an optical line of sight from a light source to a light responsive element comprising:

a cuvette for receiving fluid the properties of which are to be measured, said cuvette including an elongated chamber extending along said optical line of sight;

an optical head surrounding said line of sight and said cuvette;

a fluid circuit for supplying fluid sample to said cuvette, said fluid circuit including a coil of tubing in thermal relation to said optical head, said cuvette and coil positioned in close proximity to each other so that the liquid in the cuvette and the optical head are brought into thermal equilibrium.

3,941,488

MARKER/ANTI-MARKER SYSTEM

David Maxwell, 6035 Broadway, New York, N.Y. 10471

Filed July 10, 1974, Ser. No. 487,292

Int. Cl. B43k *27/10, 5/00*

U.S. Cl. 401—17 **1 Claim**

1. An indicator/reagent coupled marking system comprising:

a marker having a barrel containing a marking liquid, a writing tip at one end of the marker barrel and means to feed the marking liquid from the said barrel to the said tip;

an eraser coupled with the marker having a barrel containing a liquid capable of erasing marks made by the said marking liquid, an erasing tip at one end of the eraser barrel and means to feed the erasing liquid from the said eraser barrel to the said eraser tip;

a unitary one-piece cap and support means for both the marker and the eraser, the cap and support means being open at both ends and hollow, one end being adapted to receive either end of the marker and the other end adapted to receive either end of the eraser whereby the tips can be inserted into the cap and support means for protection or exposed for use and the cap and support means adapted to support both the marker and eraser simultaneously as a unitary one-piece structure whether one or both of the marker and eraser are capped or exposed for use; and

a diaphragm sealingly positioned in the cap and support means intermediate the ends thereof to separate one end

portion from the other end portion and thereby preventing communication between the portion of the cap and support means containing the marker and the portion of the cap and support means containing the eraser.

3,941,489

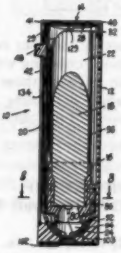
FLAT TOP ONE-HAND CYLINDRICAL LIPSTICK CASE

James W. Bryan, Madison, Conn., assignor to VCA Corporation, Greenwich, Conn.

Filed Mar. 22, 1974, Ser. No. 453,948

Int. Cl. A45d *40/06*

U.S. Cl. 401—59 **18 Claims**



1. A dispensing holder for lipsticks and the like, comprising, in combination:

a. a substantially cylindrical casing having an open top end which is substantially perpendicular to the longitudinal axis of the casing,

b. an elongate, hollow, cylindrical, internal guide member received in said casing, said guide member having a smaller outside diameter than the inside diameter of said casing thereby providing an annular space therebetween,

c. a substantially circular, thin, wafer-like closure member disposed in said annular space and adapted to span the open end of said casing,

d. a flexible push-pull strap connected to said closure member and having an exposed finger piece,

e. cooperating guide means on said casing and said guide member to guide said strap and closure member for movement between a retracted position wherein said closure member is removed from said open end and is received in an enlarged portion provided in said annular space thereby permitting said closure member to expand radially to assume a decreased concavo-convex shape in the direction of the longitudinal axis of said casing and said guide member, and an advanced position wherein the closure member spans the open casing top end in a plane substantially perpendicular to the longitudinal axis of said casing and closes said open top end,

f. said open top end of the casing having a substantially circular, inwardly extending rim provided with an annular shoulder at its underside, and

g. said closure member being concavo-convex in the direction of the longitudinal axis of the casing and guide member in its retracted position, and substantially less concavo-convex in its advanced position so as to closely fit against said shoulder and constitute a tight seal therewith.

3,941,490

BALL POINT PEN

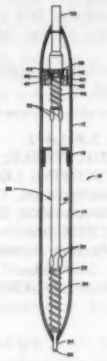
Steve M. Anton, 11314 Avenue O, Chicago, Ill. 60617

Filed Apr. 1, 1974, Ser. No. 456,832

Int. Cl. B43k *24/08*

U.S. Cl. 401—110 **4 Claims**

1. In an apparatus for projecting and retracting an elongated article in a housing having a project-retract mechanism including a non-rotatable stem for projecting said article, a rotatable intermediate member engaging said stem and said article, and spring biasing means bearing against said article and said housing for retracting said article, the improvement comprising a coil spring in compression disposed between and



bearing against said article and said intermediate member, said spring having its longitudinal axis coincident with that of said article and said stem, whereby said coil spring causes said article to rotate incrementally through a portion of a circle each time said stem is depressed.

3,941,491

FOUNTAIN PEN

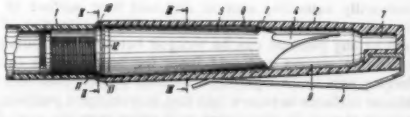
Otto Mutschler, Ludolf-Krehl-Strasse 21, D-69 Heidelberg, Germany

Filed Mar. 11, 1975, Ser. No. 557,362

Claims priority, application Germany, Mar. 27, 1974, 2414678

Int. Cl. B43k *9/00*

U.S. Cl. 401—243 **10 Claims**



1. A writing implement comprising:

a. an elongated barrel having a longitudinal axis and formed with a cavity adapted to contain ink;

b. a writing tool projecting from one axially terminal portion of said barrel and communicating with said cavity for dispensing said ink;

c. an elongated cap having a longitudinal axis and formed with an axial bore open in one axial direction and closed in the other axial direction,

1. said bore being dimensioned for relative coaxial translatory movement of said cap and of said barrel toward and away from a closed position in which said writing tool is received in said bore,

2. said writing tool and said cap in said position bounding an air chamber separating said tool in said bore from said cap in said other axial direction and in all radial directions;

d. three circumferentially spaced, axially elongated guide ribs projecting from said cap in said bore and radially engaging said barrel in said closed position;

e. a plurality of circumferentially spaced radial projections on said cap in said bore adjacent the axially open end of said bore; and

f. an annular sealing rib projecting from said barrel in a radial plane, the barrel being formed with a circumferential annular groove offset from said sealing rib in an axial direction away from said writing tool,

1. said projections and said guide ribs axially bounding therebetween an annular face portion of said cap in said bore, said face portion being of circular cross section,

2. said sealing rib sealingly engaging said face portion in said closed position.

3,941,492
TRIPOD WITH ADJUSTABLE, POLYGONAL, TELESCOPING LEGS

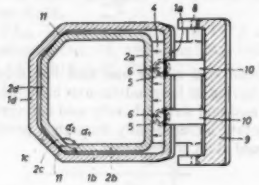
Helmut Meinunger, Radevormwald, Germany, assignor to Kurbi & Niggeloh, Radevormwald, Germany

Filed Aug. 8, 1974, Ser. No. 495,827

Claims priority, application Germany, Nov. 8, 1973, 2355900; Feb. 12, 1974, 2406609

Int. Cl.² F16B 7/14; F16M 11/26

U.S. Cl. 403—104 **8 Claims**



1. In a tripod with adjustable telescoping legs, each of said legs comprising an inner prismatic leg and an outer substantially similar prismatic leg, said legs having cross-sections which are polygonal, each of said legs having a base surface with lateral surfaces extending therefrom to surfaces forming obtuse angles with said lateral surfaces, said outer leg having surfaces with obtuse angles slightly greater than the obtuse angles of said inner leg surfaces, said base surface of said outer leg comprising an outwardly extending section, a spring-biased roller member disposed transversely between said outwardly extending section and said base surface of said inner leg whereby said roller member upon extension of said legs to any position can be wedged between said outwardly extending section and said inner leg base surface thereby forcing said inner leg obtuse surfaces against said outer leg obtuse surfaces to secure said legs in a clamped position, and release means for depressing said roller member away from said outwardly extending section to thereby release said legs from said clamped position.

3,941,493
DEVICE FOR MOUNTING SPHERICAL PISTON-ROD ENDS OF BARREL-TYPE HYDRAULIC MACHINE

Alain Lagnitre, Annecy, France, assignor to Societe Nouvelle de Roulements, Annecy, France

Filed Oct. 9, 1974, Ser. No. 513,453

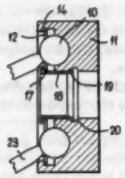
Claims priority, application France, Oct. 11, 1973, 73.36349

Int. Cl.² F16C 11/06

U.S. Cl. 403—122 **3 Claims**

1. In a rotary cylinder-barrel hydraulic machine having a plate including cavities, piston rods with ball-shaped ends mounted in the cavities, an elastically deformable annular clip having an undulating peripheral configuration and having:

a plurality of arcuately spaced radial loops about said clip each comprising a central portion coacting with a respectively corresponding ball-shaped end to be retained by said clip, an outer portion coacting with axial abutment provided on the plate to retain said loop, and an inner portion interconnecting said loop to adjacent loops and



coacting with a retaining member cooperating with the plate, each of said loops coacting with a respective ball-shaped end to retain each of those ends in the corresponding cavities while deforming to compensate for errors in the positioning of the ball-shaped ends.

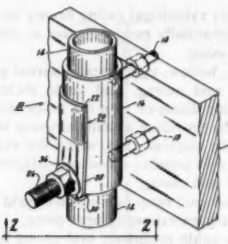
3,941,494
PIPE CLAMP

Gary J. Ehlenbeck, 4782 N. Woodruff Ave., Whitefish Bay, Wis. 53217

Filed Feb. 22, 1974, Ser. No. 444,721

Int. Cl.² F16B 7/08, 9/00; F16L 41/00

U.S. Cl. 403—188 **14 Claims**



1. A device affixable to the exterior surface of a pipe, said device comprising:

a tubular collar suitable for internally receiving the pipe in close proximity thereto;

a clamping member having a jaw adapted to engage said pipe depending therefrom and extending radially toward the pipe;

means coupling said clamping member to said collar for drawing said jaw radially into engagement with said pipe for securing said pipe against movement within said collar; and

a bracket mounted on said collar having bolts extending therethrough for joining other structural elements to said bracket, at least one of said bolts being so located as to extend through said bracket into the path of the pipe through said collar to comprise a means for limiting the movement of the pipe through said collar.

3,941,495
BALL AND SOCKET JOINT AND METHOD OF MAKING THE SAME

Lane Duncan, 221 Hindry Ave., Inglewood, Calif. 90301

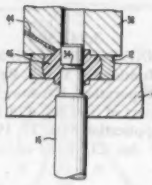
Filed Mar. 14, 1975, Ser. No. 558,603

Int. Cl.² B25G 3/34; F16B 11/00, 12/04

U.S. Cl. 403—267 **4 Claims**

1. A method of making a ball and socket bearing joint of dimensions such that the ball cannot be assembled within the socket without interfering with a portion of the socket, the

method comprising: positioning a complete bearing socket having a link portion and a bushing portion having a socket hole with a continuous inner part spherical surface in a mold and supporting the socket so that the inside surface of the socket can function as an outer wall of a mold for the ball, supporting a ball support in the mold so that it is concentric within the socket, the mold defining the edges of cavity having



its outer surface defined by the part spherical surface of the socket bushing and an inner surface defined by the ball support and molding a plastic resin which shrinks upon setting within the mold and socket inner surface on the ball support to form the entire ball, the shrinking of the plastic resin providing a uniform bearing clearance between the socket and the ball.

3,941,496

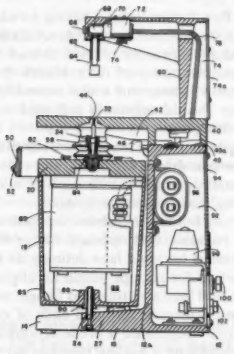
DRILLING MACHINE FOR PLASTER CASTS OR MODELS

Bernard Weissman, 236 Fifth Ave., New York, N.Y. 10001

Division of Ser. No. 320,275, Jan. 2, 1973, Pat. No. 3,854,836. This application Sept. 25, 1974, Ser. No. 509,078

Int. Cl.² B23B *47/22, 49/00*

U.S. Cl. 408—130 **11 Claims**



1. A drilling machine for drilling holes in a plaster cast comprising a frame having a stationary horizontal drilling platform, said drilling platform having an opening therethrough and a top surface adapted to support a cast which is positionable over said opening; drilling means positioned below said drilling platform and vertically movable between two spaced vertical positions, said drilling means being adapted to receive and support a drill bit, said drill means being arranged to maintain the drill bit below said top surface in one of said positions while passing the drill bit through said opening and above said top surface in the other of said spaced positions to thereby drill a hole in the plaster cast positioned on said top surface covering said opening; hydraulic actuating means for moving said drilling means from one of said positions to the other of said positions, said hydraulic actuating means comprising a fluid cylinder connected to said drilling means, said fluid cylinder having a movable piston with a shaft movable relative to said cylinder and engageable with said frame in an extended position, fluid regulating means for selectively supplying fluid to said cylinder to extend said shaft from said cylinder into engagement with said frame; said drilling means including a motor housing, said frame having a lower ledge at least partially disposed below said motor housing, said air cylinder being mounted on said housing, said shaft normally being in a retracted position and being movable to an extended position in response to filling said cylinder with a fluid, said cylinder being arranged to have said engage said lower ledge when fluid is forced into said cylinder, whereby said housing is moved towards said other position.

3,941,497

TOOL HOLDER WITH CONTROLLED TOOL MOVEMENT

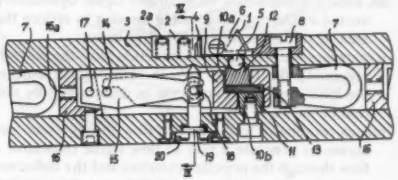
Andre Ballini, Billancourt, France, assignor to Regie Nationale des Usines Renault, France

Filed Nov. 30, 1973, Ser. No. 420,597

Claims priority, application France, Dec. 27, 1972, 72.46387

Int. Cl.² B23B *29/00;* **B23G** *3/00*

U.S. Cl. 408—155 **8 Claims**

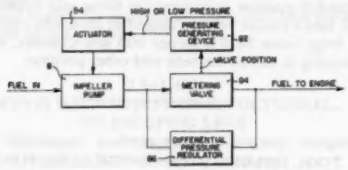


1. A bore machining bar comprising an internal channel and at least one externally facing cavity, a tool bit mounted in said cavity so as to be movable radially away from said bar, a passage provided between said cavity and said channel, a tool adjustment device comprising first bearing means movably disposed in said channel to coact with said tool bit through said passage, and second bearing means secured within said channel in a radially opposed and axially offset position relative to said first bearing means, a scaling lever extending longitudinally in said channel and having one of its ends engaging said first and second bearing means, means for adjusting the position of the other end of said scaling lever in a direction transverse to said channel and substantially in a radial plane passing through said first and second bearing means, said adjusting means comprising a control screw penetrating radially into said channel and being held against axial movement in the bar, a nut cooperating with said screw, and intermediate means disposed in said channel cooperating with the other end of said scaling lever and said nut, the rotation of said screw causing displacement of said intermediate means, said displacement of said intermediate means causing the scaling lever to pivot on said second bearing and bear against the first bearing to obtain tool bit adjustment.

3,941,498
VARIABLE GEOMETRY COLLECTOR FOR CENTRIFUGAL PUMP

Allen Duckworth, Glastonbury, and Richard J. Hearn, New Hartford, both of Conn., assignors to Chandler Evans Inc., West Hartford, Conn.

Filed Apr. 8, 1974, Ser. No. 458,567
Int. Cl.² F04D 15/00
U.S. Cl. 415—46 **5 Claims**



1. In an impeller-type pumping arrangement, the combination comprising:

a housing having an impeller chamber and a collector with an inlet encircling the impeller chamber;

an impeller mounted for rotation within the impeller chamber for forcing fluid into the collector via the inlet thereof;

a ring mounted upon the housing in coaxial relationship to the impeller for rotation and for axial movement toward and away from the collector such that the inlet area of the collector is respectively reduced and increased;

cam means responsive to rotation of the ring to axially move the ring such that the inlet area is reduced and increased in accordance with the sense of rotation of the ring;

an actuator responsive to a control signal operatively connected to the ring for rotating the ring to reduce the inlet area of the collector for low flow rates;

a metering means in fluid connection with the collector for regulating the rate of flow therethrough irrespective of the inlet area of the collector as determined by the position of the ring;

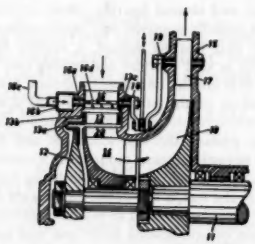
means responsive to the rate of flow through said metering means to generate a rate of flow signal indicative of the flow through the impeller chamber and the collector; and

means responsive to the rate of flow signal to generate the control signal for the actuator when the rate of flow falls below a predetermined level.

3,941,499
COMPRESSOR HAVING TWO OR MORE STAGES

Sven-Olof Kronogard, Lomma, Sweden, assignor to United Turbine AB & Co., Kommanditbolag, Malmo, Sweden

Filed Nov. 6, 1974, Ser. No. 521,540
Int. Cl.² F01D 5/00, 17/00
U.S. Cl. 415—116 **3 Claims**

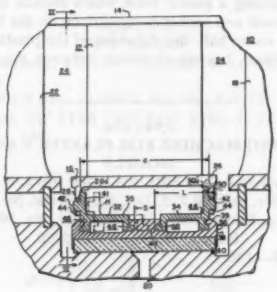


1. In a two stage compressor, of which the first stage is a centripetal stage, and the second one is a centrifugal stage of the disc type, mounted upon a common shaft and together forming a flow path where the fluid to be compressed flows radially inwards the first stage and radially outwards in the second stage, the improvement being that the first centripetal stage is provided with adjustable inlet guide vanes as well as with outlet vanes immediately downstream of the rotor vanes, said inlet, rotor and outlet vanes, respectively, being individually formed with the same profile over the full length of the respective type of vane.

3,941,500
TURBOMACHINE INTERSTAGE SEAL ASSEMBLY

Robert G. Glenn, Huntingdon Valley, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 478,129, June 10, 1974, abandoned. This application Mar. 27, 1975, Ser. No. 562,614
Int. Cl.² F16J 15/50
U.S. Cl. 415—136 **4 Claims**



1. In an axial flow turbomachine having an annular array of stator vanes with inner shroud segments secured to said vanes, a rotor disc radially inwardly of said shroud segments and supporting an annular array of rotor blades disposed axially adjacent said stator vanes, and a seal assembly disposed between said inner shroud segments and said rotor disc, said assembly comprising:

a pair of opposed flange members extending radially inwardly from said shroud segments, and separated a predetermined axial dimension, with each of said flange members defining radially extending slots;

a pair of seal ring holding members disposed within the axial dimension between said opposed flange members, each holding member having a face defining an axially extending key portion for receipt within an aligned slot in said flange with said face abutting said flange, and an opposite terminal end, with said terminal ends of each pair being axially spatially separated a predetermined distance;

a seal ring comprising a sealing member for facing contact with said rotor disc and means for mounting said sealing member on said holding members, said mounting means in cooperation with said seal ring holding members providing complimentary track and channel engagement, said mounting means further defining a radially extending portion disposed between the opposed terminal ends of said seal ring holding members to limit the axial movement of each holding member to less than the axial dimension of the key portion;

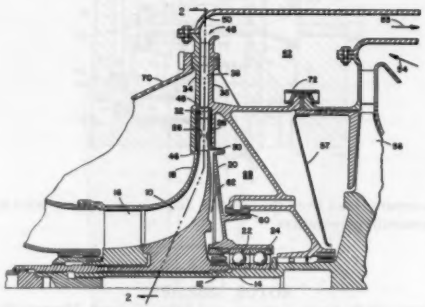
whereby, after the seal ring is circumferentially slid into position on said seal holding members, said keys of said seal holding members are prevented from axial disengagement from within the slots of said flanges; and,

means for attaching the seal ring to at least one of said seal holding members to prevent circumferential movement of one with respect to the other.

3,941,501
DIFFUSER INCLUDING A ROTARY STAGE

Wayne C. Shank, Tucson, Ariz., assignor to Avco Corporation, Williamsport, Pa.

Filed Nov. 18, 1974, Ser. No. 524,358
Int. Cl.² F01D 13/02
U.S. Cl. 415—147 6 Claims



1. In a centrifugal compressor of the type having a shaft-driven rotary radial-flow impeller for delivering compressible gas at a supersonic velocity, a multistage diffuser comprising:

a rotary stage having a pair of annular axially spaced front and back walls, each of said walls having an inner and an outer circumference, said inner circumference closely surrounding said impeller, the annular space between said walls defining a vaneless flow passage for receiving gas radially discharged from said impeller, means for rotating said rotary stage concentric with said impeller, said means comprising a disk rotatably supported on said impeller shaft, an elastic web interconnecting said disk with the back wall of said rotary stage, said web being positioned at a radius approximately equal to the radius of said impeller, and means for supporting the front wall of said rotary stage from said back wall, said means comprising a multiplicity of equi-angularly spaced struts of streamlined cross section connected between said walls at the outer peripheries thereof; and

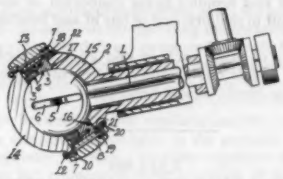
a fixed stage having a pair of axially spaced front and back walls, said walls having an inner periphery closely surrounding the outer periphery of said rotary stage, and having a plurality of symmetrically arranged vanes mounted between said spaced walls of said fixed stage; the annular space between said walls and said vanes defining flow passages for receiving gas discharged by said rotary stage.

3,941,502
SCREW PROPELLER ASSEMBLIES

Albert Jackson, 379 Vale Ave., Ferndale, Randburg, Transvaal Province, South Africa

Filed July 9, 1974, Ser. No. 486,912
Claims priority, application South Africa, July 10, 1973, 73/4617
Int. Cl.² B63H 3/02
U.S. Cl. 416—83 9 Claims

1. A screw propeller assembly comprising a propeller shaft having associated therewith a universal joint defined by a ball rotatable in unison with the propeller shaft, a pair of jointing members connected together with one of these jointing members being located on each side of a diametrical plane through the ball and having internal surfaces shaped for co-operation with the ball, and at least one lug for transmitting rotation of the ball to the jointing members, a blade hub carried by the jointing members and a swash member co-operating with the jointing members to hold the axis of rotation of the hub at an incline to the axis of rotation of the propeller shaft, means for rotating the swash member in a direction opposite that of the

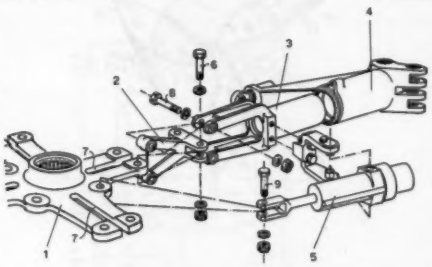


propeller to cause said axis of rotation of the hub to describe a conical locus and thereby impart a paddle action to the blades.

3,941,503
HELICOPTER ROTOR HUB PROVIDED WITH FLEXIBLE ELEMENTS SUCH AS VIRTUAL HINGES

Andre Bruel, Cascina Costa, Italy, assignor to Costruzioni Aeronautiche Giovanni Agusta S.p.A., Cascina Costa, Italy

Filed May 24, 1974, Ser. No. 472,458
Claims priority, application Italy, Mar. 7, 1974, 49159/74
Int. Cl.² B64C 27/38
U.S. Cl. 416—141 6 Claims



1. A helicopter rotor hub for mounting a plurality of rotor blades to be driven by a main drive shaft of a helicopter comprising:

a center plate having a middle portion for connection to the main drive shaft of the helicopter, said center plate having a generally flat planar configuration lying in a plane extending generally perpendicularly to said main drive shaft;

a plurality of projecting arms spaced equiangularly about said middle portion;

means defining a radially extending slot in each of said projecting arms, said slot extending radially along the middle length of said projecting arm;

a plurality of flexible elements each having a generally flat planar configuration lying in the plane extending perpendicularly to said projecting arms, each of said flexible elements being fitted into one of said slots of said projecting arms;

means defining a first end of each of said flexible elements located adjacent to said middle portion of said center plate;

means defining a second end of each of said flexible elements located remote from said middle portion of said center plate;

means defining an end of each of said projecting arms located at the terminal portion thereof furthest away from said middle portion;

means connecting each of the second ends of each of said flexible elements to one end respectively of each of said projecting arms;

a plurality of spindles each having a first end proximate said middle portion of said center plate and a second end remote therefrom,

each of said spindles being connected at said first end thereof to said first end of one of said flexible elements; and

a plurality of grips, each of said grips connected to said second end of one of said spindles, said grips mounting the rotor blades of said helicopter.

3,941,504

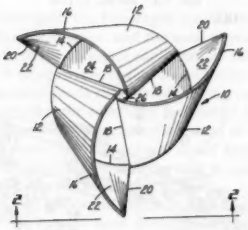
WIND POWERED ROTATING DEVICE

Henry C. Snarbach, 12644 Valley View Drive, Chesterland, Ohio 44026

Filed Aug. 28, 1974, Ser. No. 501,029

Int. Cl.² F03D *3/06*

U.S. Cl. 416—197 A **5 Claims**



1. An omni-directional windmill device comprising, a plurality of blades circumferentially symetrically disposed with respect to each other,

each of said blades having a lower edge and upper edge, each of said blades having a wind reaction surface being arcuate in transverse cross section and helically formed longitudinally from said lower to said upper edge, said lower edges lying on a circle, said upper edges having one end which terminates at a common location within a projection of said circle on the plane of said edges, each of the upper edges curving arcuately from said common location to a point, the locus of which points lie on a circle radially spaced from said common location, and means to mount said device for rotation.

3,941,505

METHOD AND APPARATUS FOR PUMPING FUEL

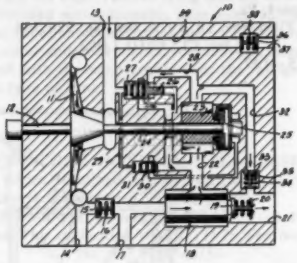
Pius J. Nasvytis, Willoughby, and Milton W. Mueller, Cleveland, both of Ohio, assignors to TRW Inc., Cleveland, Ohio

Filed June 25, 1973, Ser. No. 373,603

Int. Cl.² F04B *23/14*, *49/00*

U.S. Cl. 417—202 **11 Claims**

1. A fuel pumping system comprising a main stage including a centrifugal pump, a secondary stage including a positive displacement pump, a common drive means for said main stage and said secondary stage, speed responsive means associated with said positive displacement pump and responsive to the speed of said centrifugal pump to terminate pumping action by said positive displacement pump upon said centrifugal pump reaching a predetermined speed, and a valve means



to remove load from the positive displacement pump prior to terminating operation.

3,941,506

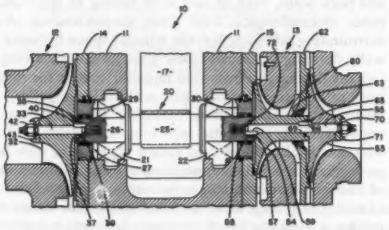
ROTOR ASSEMBLY

Raymond R. Robb, Latrobe, and Vijay K. Sood, Murrysville, both of Pa., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Sept. 5, 1974, Ser. No. 503,401

Int. Cl.² F01D *5/06*

U.S. Cl. 416—244 A **6 Claims**



1. A rotor assembly for use in an overhung rotary machine wherein the rotor components are cantilevered from the end of a shaft including

a drive shaft operatively connected to the machine drive and rotatably supported in a base frame with at least one end of the shaft extending outwardly beyond said frame, the extended end face of the shaft having an aperture formed therein,

a stud secured to the shaft and extending outwardly beyond the end face thereof in axial alignment with the shaft,

a rotor member slidably mounted upon the stud having an axially extended shoulder thereon which is press fitted into the aperture formed within the end face of the shaft to support the rotor member in axial alignment with the stud and the shaft, and

a key positioned to engage the shaft, the stud and the rotor member.

3,941,507

SAFETY SUPERVISOR FOR SUMP PUMPS AND OTHER HAZARDS

Karl O. Niedermeyer, 17W068 North St., Bensenville, Ill. 60106

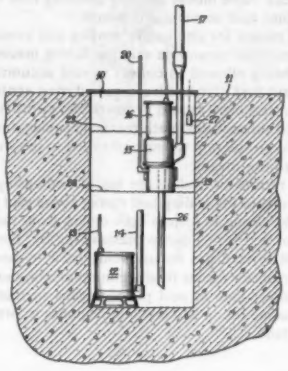
Filed Apr. 12, 1974, Ser. No. 460,423

Int. Cl.² F04B *49/06*

U.S. Cl. 417—2 **36 Claims**

1. In an apparatus for use with a sump in which there is an emergency sump pump driven by a direct current emergency

sump pump motor operated from a rechargeable battery charged by a battery charger from an alternating current power source, and including sensor means to detect the level of liquid in the sump at which said motor should be operated, and direct current circuit means connecting said motor, said power source, and said sensor means, the improvement comprising:



said direct current circuit means including a switch which is closed when said motor is energized;

wiring means connected to said alternating current power source, to said battery charger and to said switch to energize said battery charger for the charging of said battery when said motor is energized.

3,941,508

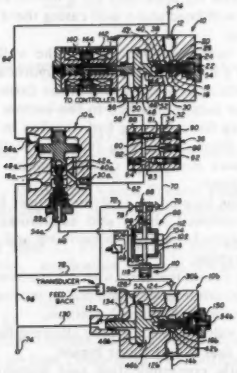
AUTOMATIC PRESSURE CONTROL SYSTEM

Donald A. Worden, Pompton Plains, N.J., assignor to Marotta Scientific Controls, Inc., Boonton, N.J.

Filed Apr. 11, 1975, Ser. No. 567,090

Int. Cl.[2] F04B *49/00, 23/12*

U.S. Cl. 417—46 **16 Claims**



1. A pressure supply system for supplying adjustable and controlled outlet pressure selectively lower or higher than a gas supply pressure, including in combination a first pressure regulator connected on its upstream side to a supply source for gas under pressure, a port on the downstream side of the first pressure regulator from which gas under controlled and reduced pressure is supplied to the system, a first passage connected with said port of the first regulator for connection with an ultimate delivery outlet, a pressure intentsifier pump connected at an intermediate location along the course of said first passage, an activator for operating the pressure intensifier pump to increase the delivery pressure from said first passage to the ultimate delivery outlet when the pressure necessary at the ultimate delivery outlet is in excess of the delivery pressure of the first regulator, a controller that operates the actuator, a connection between the first regulator and the controller for making the controller responsive to the pressure at the first pressure regulator, a second pressure regulator with an upstream port for connection with a source of intermediate pressure fluid, and means connected with the downstream side of the second pressure regulator for restoring the pressure intensifier pump actuator to position for a successive operation when the actuator has been operated by said controller through a stroke that intensifies the pressure delivered to the ultimate delivery outlet.

3,941,509

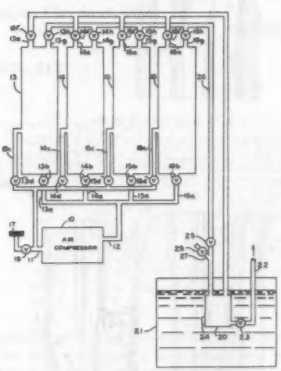
PUMPING SYSTEM

James E. Gillilan, Sweetwater, Tex., and Henry M. Townsend, Reedsport, Oreg., assignors to Fluid Systems Research, Inc., Winchester Bay, Oreg.

Filed Aug. 2, 1974, Ser. No. 494,062

Int. Cl.[2] F04B *23/14;* **F04F** *1/06, 3/00*

U.S. Cl. 417—54 **2 Claims**



1. In the use of a compressed gas in pumping a liquid against a pressure head,

the improvement comprising the steps of:

a. compressing a gas using a compressor to a first predetermined relatively high superatmospheric pressure in a first relatively large tank;

b. discharging said gas from said first relatively large tank into a relatively small tank filled with a liquid to force said liquid out of said small tank against a pressure head and simultaneously to pressurize said small tank with said relatively high pressure gas from said first tank;

c. exhausting said relatively high pressure gas from said small tank into a second relatively large tank filled with gas at a substantially lesser pressure than said gas in said first relatively large tank to reclaim said gas in said small tank;

d. refilling said small tank with liquid and repeating steps b and c until said second relatively large tank is brought to a second predetermined superatmospheric pressure less than said pressure maintained in said first relatively large tank; and then

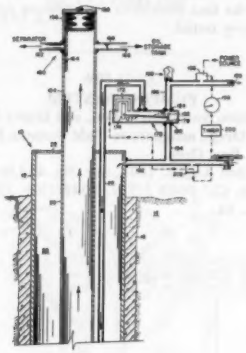
e. connecting said second relatively large tank to the inlet of said compressor to reduce the pressure head thereacross and thereby reduce the power required to compress said gas in said first relatively large tank to said first predetermined relatively high superatmospheric pressure.

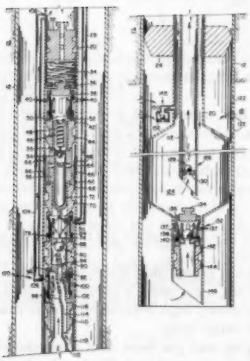
3,941,510

ARTIFICIAL LIFT FOR OIL WELLS

Thomas H. Morgan, Suite 528 800 NW. Loop 410, San Antonio, Tex. 78216

Division of Ser. No. 496,173, Aug. 9, 1974, Pat. No. 3,894,583.
This application Apr. 14, 1975, Ser. No. 567,989
Int. Cl.[2] F04B *47/12, 23/14, 35/00*
U.S. Cl. 417—57 6 Claims





1. An artificial lift apparatus for a hydrocarbon producing well having a well head and a well casing therein, said apparatus comprising:

production tubing extending from the well head into the casing to a level below which the hydrocarbon will naturally fill from a hydrocarbon producing zone through perforations in the casing;

accumulator means attached to the bottom of the production tubing for collecting hydrocarbon in the well;

gas tubing means extending from the well head into the accumulator means for communication therewith from the well head;

piston means located in said production tubing and normally positioned above said accumulator means, said piston means being free to move up and down said production tubing;

path means communicating with said accumulator for moving hydrocarbon above said piston means when said piston means is in its normal position;

first check valve means for only allowing flow of hydrocarbon into said accumulator means;

control means for alternately venting and pressurizing said accumulator means via said gas tubing means, hydrocarbon being allowed to collect in said accumulator means via said first check valve means during venting, thereafter, in response to said pressurizing, said hydrocarbon is moved through said path means above said piston means in said production tubing and raised to the well head with said piston means;

sealing means for sealing the top of said casing;

packer means for sealing said casing above said perforations in said casing to form a tank means from the upper portion of said casing means pressurizing said tank with gas;

said pressurized gas means being used to pressurize said accumulator means fluidly communicating said tank with the lower face of said piston means so that said piston means moves up and down in response to pressure within said tank.

3,941,511

ARTIFICIAL LIFT FOR OIL WELLS

Thomas H. Morgan, 800 NW. Loop 410, San Antonio, Tex. 78216

Division of Ser. No. 476,212, June 4, 1974, Pat. No. 3,894,814.
This application Jan. 31, 1975, Ser. No. 545,779
Int. Cl.[2] F04B *47/12, 23/14, 35/00*
U.S. Cl. 417—57 10 Claims

1. An artificial lift apparatus for a hydrocarbon producing well having a well head and a well casing therein, said apparatus comprising:

production tubing extending from the well head into the casing to a level below which the hydrocarbon will naturally fill through perforations in the casing;

accumulator means attached to the bottom of the production tubing for collecting hydrocarbon in the well;

gas tubing means extending from the well head into the accumulator means for communication therewith from the well head;

piston means located in said production tubing and normally positioned above said accumulator means, said piston means being free to move up and down said production tubing;

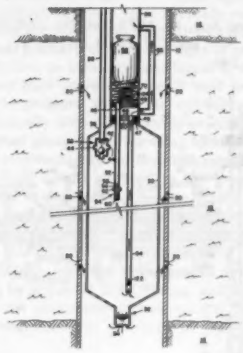
path means communicating with said accumulator for moving hydrocarbon above said piston means when said piston means is in its normal position;

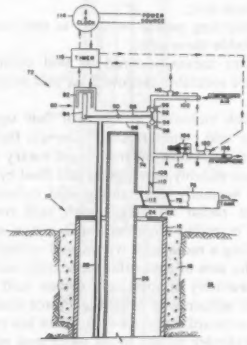
first check valve means for only allowing flow of hydrocarbon into said accumulator means;

means fluidly communicating said accumulator with the lower face of said piston means so that the piston moves up and down in response to the pressure within said accumulator;

control means for alternately venting and pressurizing said accumulator means via said gas tubing means, hydrocarbon being allowed to collect in said accumulator means via said check valve means during venting, thereafter, in response to said pressurizing, said hydrocarbon is moved

through said path means above said piston means in said production tubing and raised to the well head with said





piston means as pressure in said accumulator continues to increase.

3,941,512

VENTILATING ARRANGEMENT FOR STEAM FLOW VACUUM PUMP

Michel Albertin, Annecy Le Vieux, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, France

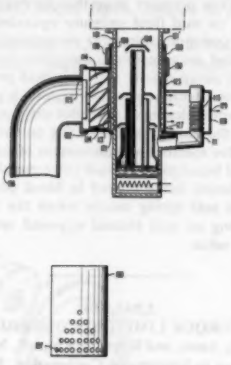
Filed Sept. 27, 1973, Ser. No. 401,543

Claims priority, application France, Sept. 27, 1972, 72.34187

Int. Cl.² F04F 9/00

U.S. Cl. 417—153 **3 Claims**

1. in a steam flow vacuum pump cooling means for cooling the pump by an air flow comprising a cylindrical pump body provided with grooves on at least a portion of the outer surface thereof, a cylindrical housing coaxially mounted on said pump body to enclose at least the portion thereof containing said grooves, said cylindrical housing having a radius which is only slightly larger than the radius of said pump body, and ventilator means connected to an intake opening in said cylindrical housing for supplying an air flow to said housing, said housing also including a plurality of vent holes to permit escape of said air flow, characterized in that the vent holes are disposed in successive circumferential rows in said housing



and the number of vent holes in each row decreases from the bottom of the pump towards the top thereof.

3,941,513

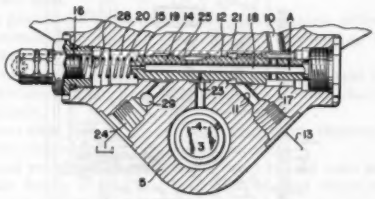
VARIABLE DISPLACEMENT PUMP CONTROL ASSEMBLY

Thomas J. Malott, Mentor, Ohio, assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Sept. 5, 1974, Ser. No. 503,399

Int. Cl.² F04B 1/26

U.S. Cl. 417—212 **15 Claims**



1. Pressure compensating means for a variable displacement pump of the type including a housing having pump means, high and low fluid pressure zones, and a fluid pressure operated number operatively engaged with said pump means to vary the displacement thereof, said fluid pressure operated member having restricted fluid communication with said high pressure zone; said pressure compensating means comprising a valve member movable in said housing to open and close a bleed passage from said fluid pressure operated member to said low pressure zone and having first opposed areas including an area on one side thereof exposed to fluid pressure in said high pressure zone and an area on the other side exposed to fluid pressure in said high pressure zone via orifice means; spring means in said housing biasing said valve member to bleed passage closing position; said valve member having second opposed areas respectively exposed to said high pressure zone and to a pressure sensing passage which is communicated with the downstream side of a variable area orifice in the pressure feed path from said high pressure zone to a fluid motor actuated by fluid under pressure flowing through said variable area orifice from said high pressure zone; and a pilot valve in said housing opened upon increase of fluid pressure in said high pressure zone to predetermined magnitude to bleed fluid pressure acting on the area on said other side of said valve member to said low pressure zone whereby predominant fluid pressure upstream of said orifice means acting on

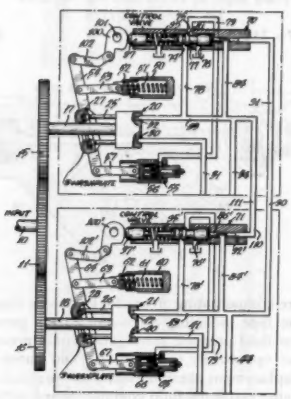
the area on said one side of said valve member is effective to move said valve member to a position to open said bleed passage to said low pressure zone thus to decrease the fluid pressure acting on said fluid pressure operated member via said restricted communication for movement of said fluid pressure operated member in a direction to decrease the capacity of said pump means until the fluid pressure in said high pressure zone decreases to less than such predetermined magnitude to permit closing of said pilot valve and consequent equalization of the fluid pressures acting on the first opposed areas of said valve member and movement of said valve member to close said bleed passage; said valve member, while said pilot valve is closed, being moved to bleed passage opening position against said spring means when the fluid pressure differential acting on said second opposed areas exceeds a predetermined value.

3,941,514

TORQUE LIMITING CONTROL

Joseph E. Louis, Ames, and Roger D. Cannell, Nevada, both of Iowa, assignors to Sundstrand Corporation, Rockford, Ill.

Filed May 20, 1974, Ser. No. 471,573
Int. Cl.² F04B *49/00*
U.S. Cl. 417—216 **10 Claims**



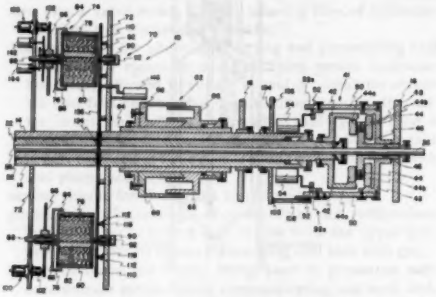
1. A torque limiting control for a pair of variable displacement hydraulic pumps each having displacement varying means, comprising, means for urging each of said displacement varying means to a position for maximum pump displacement, fluid operated means operable to shift said displacement varying means against said urging means to reduce pump displacement, a first control valve responsive to the sum of the fluid pressures generated by both pumps for directing fluid pressure to said fluid operated means for one of the pumps, a second control valve responsive to the sum of the fluid pressures generated by both pumps for directing fluid pressure to said fluid operated means for the second of said pumps, and a pair of feedback means associated one with each of said control valves for feedback of the positioning of the pump displacement varying means.

3,941,515

CENTRIFUGAL FLUID PUMP

Joseph R. Austin, 2513 20th Road North, Apt. 201, Arlington, Va. 22201

Filed Apr. 16, 1975, Ser. No. 568,625
Int. Cl.² F04D *29/26*
U.S. Cl. 417—240 **14 Claims**



1. A centrifugal rotary powered fluid generating assembly comprising:

a rotary assembly having a longitudinal axis about which the same may rotate;

means for rotatively driving said rotary assembly about said longitudinal axis;

cylinder mounting means secured to said rotary assembly and rotatable therewith;

fluid cylinder means secured to said cylinder mounting means and rotatable therewith as said rotary assembly is driven;

a supply tank including a source of fluid operatively connected to said cylinder means wherein fluid can be supplied to the cylinder means of said rotary assembly;

piston means slidably mounted in said fluid cylinder means;

means for normally maintaining said cylinder and piston means in radial alignment with said rotary assembly wherein in radial alignment said piston means tend to move along a radial axis within said cylinder means relative to the axis of said rotary assembly, such that as said rotary assembly is rotatively driven said piston means under the influence of centrifugal force tends to be forced radially outwardly and away from an inward end portion of said cylinder means to an outer end portion thereof, forcing and expelling fluid under pressure from the outer end portion of said cylinder means while inducing fluid to enter the inward end portion of said cylinder means, whereby the energy associated with the pressurized fluid flow being expelled from the cylinder means can be selectively directed and harnessed and used; and

recharging means for recharging said cylinder means after the piston means has completed its power stroke and is disposed in the outer end portions of said cylinder means, said recharging means including means for rotating said cylinder means and the piston means associated therewith approximately 180° relative to said cylinder mounting means to a position where said cylinder and piston means are radially aligned with said rotary assembly and said fluid within said cylinder means is disposed generally outwardly of the position assumed by said piston means.

3,941,516

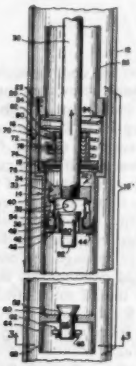
WATERWELL PUMP ASSEMBLY

Arnold S. Soberg, 1323 Degener Ave., Elmhurst, Ill. 60126

Filed Sept. 4, 1974, Ser. No. 502,928
Int. Cl.² F04B *3/00*
U.S. Cl. 417—259 **2 Claims**

1. A pump assembly adapted to be supported at a selected pumping level within a tubular well casing and effective to repeatedly withdraw quantities of liquid and gas from said casing and discharge the same at ground level, said pump

assembly comprising an elongated vertically disposed cylinder having a circular bottom wall provided with a central inlet port for the admission of gas and liquid upwardly into the cylinder, a unidirectional foot valve normally seated upon said port and closing the same, said foot valve being responsive to differential fluid pressure on opposite sides of said bottom wall and being effective to admit gas and liquid upwardly through said port when fluid pressure beneath said bottom wall exceeds the fluid pressure within the cylinder, a pump shaft reciprocal vertically within said cylinder and coaxial therewith, a combined plunger and traveling valve assembly within said cylinder and including an inverted cup-shaped plunger having a top wall fixedly secured to the lower end of said pump shaft and a depending cylindrical side wall provided with circumferentially spaced ports therethrough, a tubular clamping nipple threadedly received within the lower rim region of said side wall, an elastomeric sealing ring interposed between said nipple and the lower rim of said plunger and establishing a lip seal with the cylinder, and a lift valve normally closing the upper end of said tubular nipple, said lift valve being responsive to pressure of fluid beneath said



plunger during the downstroke of the latter to bypass such fluid upwardly through said nipple and plunger, and being responsive to pressure of fluid above said plunger to prevent such upward passage of fluid, the upper end of said cylinder being formed with an enlarged diameter extension which establishes a valve housing, the juncture region between said cylinder and extension providing an annular ledge which establishes a valve seat, a floating head valve member disposed within said valve housing and encompassing said pump shaft, said head valve member including an annular disk-like valve body and an upstanding cylindrical wall concentric with the pump shaft, a packing gland disposed within said cylindrical wall and effective between the pump shaft and wall, a gland nut threadedly received in the upper end of said cylindrical wall, an elastomeric sealing ring mounted on the underneath side of said disk-like valve body and normally seated on said valve seat, a cylindrical drop tube encompassing said pump shaft and having its lower end threadedly received in the upper end of said cylindrical wall, and a compression spring interposed between the lower end of said drop tube and disk-like valve body exteriorly of the cylindrical wall and serving to yieldingly bias said valve member against said valve seat.

3,941,517

MAGNETIC HYDRAULIC PUMP

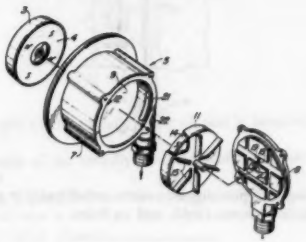
Kingo Miyahara, Tokyo, Japan, assignor to Dowa Co., Ltd., Japan

Filed Sept. 11, 1974, Ser. No. 504,976

Claims priority, application Japan, Sept. 29, 1973, 48-114256[U]

Int. Cl.² F04B *17/00, 21/00;* **B01F** *5/16*

U.S. Cl. 417—420 **2 Claims**



2. A magnetic pump for agitating different kinds of liquid, comprising:

a drive shaft,

first permanent magnet means having alternately different positive and negative polarities and surrounding and attached to said drive shaft,

a pump casing provided in opposed relation to said first permanent magnet means and defining a pump chamber therein,

a cover plate forming one side wall of said pump chamber,

a rotor rotatably provided in said chamber,

second permanent magnet means fixed to said rotor on a side facing to said first permanent magnet means and having alternately different polarities arranged similar to those on said first permanent magnet means,

blades provided on said rotor on the side opposed to said second permanent magnet means,

agitating cross-shaped grooves formed in the inner surface of said cover plate forming one side wall of said pump chamber,

an inlet port formed in said cover plate and communicating with at least one of said agitating grooves for introducing liquid, and

an outlet port formed in said pump casing and communicating with said pump chamber.

3,941,518

STEAM-SPRAY IRON

John L. Eaton, Delanco, N.J.; John C. Fagan, Philadelphia, and Roger V. Eeckhout, Warminster, both of Pa., assignors to SCM Corporation, New York, N.Y.

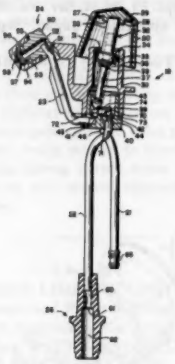
Division of Ser. No. 363,965, May 25, 1973, Pat. No. 3,881,265. This application Feb. 18, 1975, Ser. No. 550,705

Int. Cl.² F04B *21/00*

U.S. Cl. 417—442 **9 Claims**

1. A pump comprising a housing, a piston within said housing, an actuator having a first end telescopically engaging said piston and a second end, a biasing means between said piston and said actuator for urging separation of said telescopic

engagement, a plurality of outlets on the inside bottom of said housing, a rocker means within said housing for covering and



uncovering said plurality of outlets individually in response to said actuator's second end, and an inlet.

3,941,519

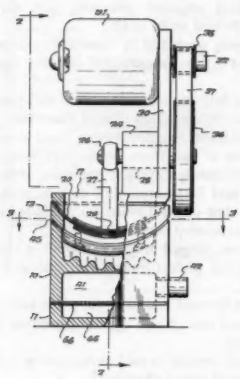
PUMP

Herbert J. McCauley, 86 Dana Road, Buffalo, N.Y. 14216

Filed Sept. 12, 1974, Ser. No. 505,580

Int. Cl.² F04B *21/02*

U.S. Cl. 417—560 **9 Claims**



1. In an expansible chamber pump, a pair of body members having opposed complementary concave and convex curved faces in transverse cross section, said faces being rectilinear in longitudinal cross section, flexible sheet means clamped between said faces to be held in curved configuration thereby, said convexly curved member having a pump chamber therein and reciprocable means for alternately expanding and contracting the same, said pump chamber opening toward said flexible sheet means, pump inlet and outlet passages in said concavely curved member and opening toward said flexible sheet means, said flexible sheet means having portions overlying said inlet and outlet passage openings, said overlying portions being connected to the flexible sheet means proper but having substantially rectilinear free edge portions extending in the direction of curvature of said flexible sheet means and adapted to be flexed toward said convexly curved member by fluid pressure from said inlet passage toward said pump chamber and by fluid pressure from said pump chamber toward said outlet passage.

3,941,520

METHOD AND DEVICE FOR INJECTION OF LIQUID

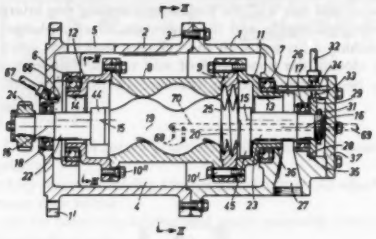
Hans Kristoffer Olofsson, Huddinge, Sweden, assigaor to Atlas Copco Aktiebolag, Huddinge, Sweden

Filed July 18, 1974, Ser. No. 489,941

Claims priority, application Sweden, July 20, 1973, 7310168

Int. Cl.² F01C *21/06*; F04C *29/04*; F01C *1/16*

U.S. Cl. 418—9 **9 Claims**



1. A method for injecting cooling liquid in a screw compressor of the type including a screw cam rotor and a screw thread enclosing the screw cam rotor, which rotors are rotatably journalled in a housing for rotation around mutually sideways displaced rotation axes and thereby form chambers for a working medium between their screw cam and screw threads, which chambers during the rotation of the rotors move from a low pressure end to a high pressure end of the rotors while decreasing their volumes, without exposing the liquid droplets to accumulation caused by change of direction or centrifugal action in their passage through the compressor, comprising injecting cooling liquid continuously into the interior screw threads of the screw thread rotor utilizing the screw thread rotor as an envelope for the liquid carrying working medium, choosing a rotational speed ralationship between the rotors to eliminate the centrifugal action therein, passing the liquid carrying working medium through the screw thread rotor essentially axially without change of direction or rotation.

3,941,521

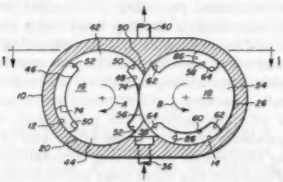
ROTARY COMPRESSOR

Roger C. Weatherston, Williamsville, N.Y., assignor to Calspan Corporation, Buffalo, N.Y.

Filed Aug. 28, 1974, Ser. No. 501,034

Int. Cl.² F04C *13/00*, *17/10*

U.S. Cl. 418—9 **12 Claims**



1. A rotary compressor, comprising;

a. a housing defining two working chambers,

b. mating impellers rotatably mounted in each of said working chambers,

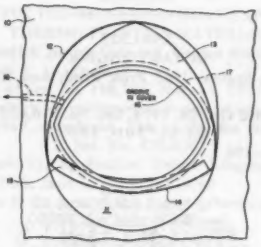
c. each impeller having at least two constant cross-sectional profiles,
d. each of said profiles comprised of at least one lobe and at least one well,
e. the lobes and wells of any one profile being angularly displaced from those of the profile immediately adjacent thereto,
f. inlet passage means extending substantially the entire length of said working chambers for communication with substantially all of said profiles, and
g. outlet passage means having a port located in the plane containing substantially one pair of profiles.

3,941,522

MODIFIED ROTARY COMPRESSOR YIELDING SINUSOIDAL PRESSURE WAVE OUTPUTS

Timothy T. Acord, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 13, 1974, Ser. No. 505,889
Int. Cl.² F04C *1/02*
U.S. Cl. 418—61 A **6 Claims**



1. In a rotary compressor device in which substantially trochoidal curves form the inner surface of the working chambers and the configuration of the internally placed rotary piston of said device and wherein side surfaces close the device to complete the working chambers, the improvement comprising:
a volume formed along a flank of said rotary piston in communication with the compression volume under said flank and adjacent a side surface;
passageway means associated with said side surface for constantly communicating with said volume as said rotary piston revolves; and
porting means communicating with said passageway means for providing an outlet for sinusoidally varying pressure generated by said device.

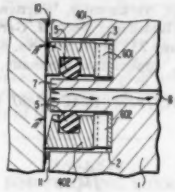
3,941,523

MULTIPLE OIL SEAL ARRANGEMENT FOR ROTARY PISTON INTERNAL COMBUSTION ENGINE

Keiichiro Shin, Ageo; Hiroshi Ozeki, and Noriyuki Kurio, both of Hiroshima, all of Japan, assignors to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Filed Oct. 30, 1974, Ser. No. 519,177
Claims priority, application Japan, Nov. 1, 1973, 48-122181
Int. Cl.² F01C *21/04*, *19/08*; F04C *29/02*, *27/00*
U.S. Cl. 418—91 **1 Claim**

1. In a rotary piston internal combustion engine having a rotary piston mounted for rotation eccentrically about the rotor axis within an engine casing with an axial thrust surface of the rotor axially facing the engine casing sidewall, and wherein the thrust surface carries radially inner and outer annular oil seal grooves axially facing the casing sidewall and separated by a narrow, annular thrust surface land portion, and wherein each groove carries an annular metal oil seal in ring form and a spring behind the oil seal and biasing the oil seal axially out of the groove such that an axial end face of the oil seal contacts the sidewall of the engine casing, and wherein each oil seal has that axial end face tapering in a radially outward direction away from the engine casing sidewall to form a lip angle therebetween, the improvement wherein:
an oil removal bore is formed within the thrust surface land portion for removing oil accumulating between the radially inner and outer seals,



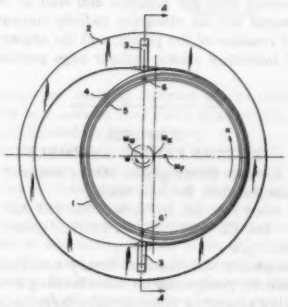
the lip angle of the radially outer oil seal is between 1° and 3°,
the lip angle of the radially inner oil seal is between 3° and 5°, and
the spring biasing force of the spring acting on the radially outer oil seal is less than that of the spring acting on the radially inner oil seal.

3,941,524

ROTARY PISTON ENGINE HAVING A TROCHOIDAL PISTON AND ANNULARLY-CLOSED AXIAL SEALS IN THE PISTON

Franz Huf, Constance, Germany, assignor to Dornier System GmbH., Germany

Filed Jan. 29, 1975, Ser. No. 545,200
Claims priority, application Germany, Feb. 13, 1974, 2406755
Int. Cl.² F04C *29/02*
U.S. Cl. 418—99 **9 Claims**



1. In a rotary piston machine comprising a jacket and two side parts forming a housing, inlet and outlet means on said housing, a piston patterned after a saddle-free epitrochoid 1:1 mounted in said housing for rotation on an eccentric shaft, annularly-closed axial seals on the sides of the piston in proximity to the piston edge, and a pair of oppositely-positioned radial seals in said housing,
the improvement which comprises that the axial seal on each side of the piston is composed of two seal means equidistant with respect to each other and being closed within themselves,
and lubricant opening means in said side parts in proximity to and in the plane of at least one of said radial seals.

said openings being located in the interstice between said two seal means or being covered temporarily at least in part by one of said two seal means as the piston rotates.

3,941,525
INTERNAL SEAL FOR THE PISTON OF A ROTARY PISTON ENGINE

Gottlieb Wilmers, Neuenstadt, and Gerhard Maurhoff, Neckarsulm, both of Germany, assignors to Audi NSU Auto Union Aktiengesellschaft, Neckarsulm, Wurttemberg and Wankel GmbH, Lindau (Bodensee), both of, Germany

Filed June 21, 1974, Ser. No. 481,867
Claims priority, application Germany, June 23, 1973, 2332071
Int. Cl.² F01C *19/08;* **F04C** *27/00;* **F02B** *55/04*
U.S. Cl. 418—142 **12 Claims**

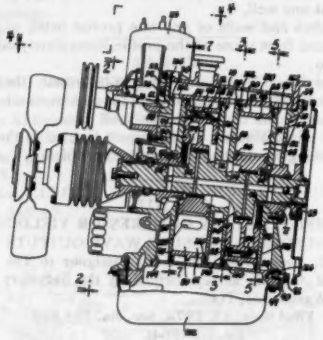
1. An internal seal for the piston of a rotary piston engine or trochoid type with a housing having two end pieces and a shell with multi-arcuate interior surface in which the piston is rotatably mounted on the eccentric of an eccentric shaft, said internal seal having at least one scraper ring arranged axially movable to a concentric annular groove in one face of the piston, said scraper ring is axially movable and adapted to revolve with the piston while being pressed against the adjacent end wall of the housing by spring action, said scrpaer ring comprising spaced scraping edge segments uniformly distributed over the circumference of the scraper ring and adapted to be in contact with the adjacent end wall of the housing, which segments are set obliquely radially outwardly in the direction of rotation of the piston, and the segments being a plurality of individual elastic scraper edge portions of sheet metal.

3,941,526
ROTARY ENGINE ASSEMBLY

Leonardas Kutkus, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 26, 1975, Ser. No. 553,329
Int. Cl.² F01C *11/00, 21/10, 19/00*
U.S. Cl. 418—149 **6 Claims**

1. A completely die castable rotary combustion engine housing assembly comprising an outer housing having a cylindrical opening extending longitudinally therethrough, a rotor housing having a cylindrical outer periphery closely fitting in said cylindrical opening of said outer housing, a pair of end housings having cylindrical shoulders closely fitting in and closing the opposite ends of said cylindrical opening of said outer housing, means for rigidly clamping one of said end housings to one end of said outer housing, a gasket between the flange of said one end housing and said one end of said outer housing, fastener means for securing the other of said end housings to the other end of said outer housing with clearance therebetween within the tolerance stack-up of the clamped parts to clamp said rotor housing between said end housings with a predetermined load whereby said outer housing grows with the clamped parts in the axial direction as the result of heat expansion during engine operation to prevent substantial change in the clamp load, and seal means for providing sealing between said other end housing and said

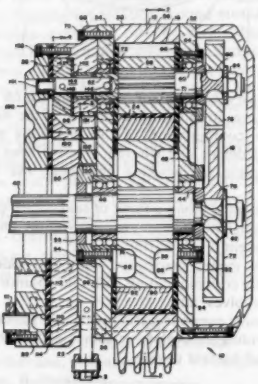


outer housing in all positions of said other end housing relative to said outer housing.

3,941,527
ROTARY ENGINE

Jackson H. Allington, 3565 Pratt Road, Ann Arbor, Mich. 48103

Filed Oct. 29, 1974, Ser. No. 518,638
Int. Cl.² F01C *1/08*
U.S. Cl. 418—196 **7 Claims**



1. A rotary engine comprising a hollow cylindrical housing having a circular opening therethrough, separate end plates secured to the housing over the opposite ends of the circular opening therethrough, a drive shaft journaled for rotation in the end plates and extending axially of the circular opening through the cylindrical housing, a cylindrical engine rotor concentrically mounted in the housing on the drive shaft for rotation in the cylindrical opening through the housing between the end plates with the drive shaft, a plurality of vanes mounted on the rotor extending radially outwardly therefrom and connected rigidly thereto to form a plurality of separate chambers between the rotor, housing, end plates and vanes, a plurality of rotary valve structures journaled for rotation in the end plates positioned angularly about the periphery of the rotor for sealing between the rotor and housing and permitting passing of the vanes therethrough, fluid inlet and outlet passages in one end plate adjacent the valve structures for permitting intake and exhaust of driving fluid into and out of the separate chambers, a separate housing member secured to the

one end plate and a cover plate secured to the separate housing member, said separate housing member and cover plate together forming further inlet and outlet passages for driving fluid in communication with the inlet and outlet passages in the one end plate, a selector plate positioned between the one end plate and further housing member, said selector plate being rotatably mounted and having additional inlet and exhaust passages extending therethrough for reversing flow between the further inlet and exhaust passages in the cover plate and further housing member and the inlet and exhaust passages in the one end plate, and separate cutoff plates secured to and associated with each of the valve structures for rotation therewith and operably associated with the further inlet passage in the further housing member for cutting off the further inlet passage in the further housing member associated with the associated valve structure during passage of a vane through the associated valve structure, and drive means connected to the drive shaft and the individual valve structures for synchronizing the rotation of the individual valve structures and the rotor, and means for introducing fluid under pressure into the further inlet passage whereby the rotor, drive shaft, valve means and cutoff plate are synchronously driven.

3,941,528
APPARATUS FOR MOULDING HEAT-EXPANDABLE THERMO-PLASTICS MATERIAL

Robert Frederick Joseph Cotterell, Caplan House, Barchester St., London E. 14, England

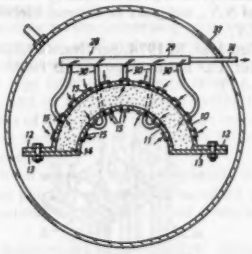
Division of Ser. No. 198,766, Nov. 15, 1971, Pat. No. 3,809,735, which is a continuation-in-part of Ser. No. 860,760, Sept. 24, 1969, abandoned. This application Jan. 30, 1974, Ser. No. 438,030

Claims priority, application United Kingdom, Sept. 26, 1968, 45717/68; June 5, 1969, 28474/69

The portion of the term of this patent subsequent to May 7, 1991, has been disclaimed.

Int. Cl.² B29D *27/00*

U.S. Cl. 425—4 R **9 Claims**



1. Apparatus for moulding relatively thick articles from heat expandable beads of synthetic thermoplastic resinous material such as polystyrene, said apparatus comprising a mould having metal walls which define a cavity wherein beads can be confined and the cavity surfaces of which correspond to the shape of an article to be moulded, means cooperating with the walls of the mould to define a chamber external to said cavity, means for introducing a hot gaseous medium under pressure into said chamber so that the medium is applied to the walls of the mould for heating the same, and means for conducting hot gaseous medium from said chamber through the mould walls and into the cavity for expanding and fusing beads therein, said apparatus being characterized by means for assuring good fusion of beads within the interior of articles moulded in the apparatus notwithstanding that such articles may have substantial thickness and, when finished, may have a substantially hard external crust, the last mentioned means comprising:

means for assuring continued venting of hot gaseous medium out of the cavity to enable continued flow of hot gaseous medium from said chamber into the cavity, comprising a plug set into a metal wall of the mould, said plug

1. having an inner surface defining part of the cavity surface of the mould,
2. having an aperture therethrough which is surrounded by said inner surface and through which fluid can pass out of the cavity, and
3. being made of a nonmetallic material capable of withstanding a pressure of 20 p.s.i. under a temperature equal to that of steam at said pressure, and having a coefficient of thermal conductivity substantially lower than that of the metal of the mould wall to ensure that beads in contact with said plug are not fused due to heat conduction therethrough prior to fusion of beads in the center of the cavity.

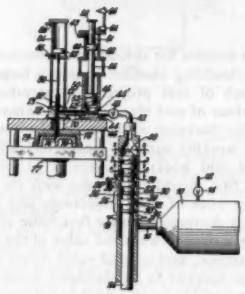
3,941,529
APPARATUS FOR FORMING THERMOPLASTIC ARTICLES

Ward J. Klingebiel, Somerville, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 42,317, June 1, 1970, abandoned, which is a continuation-in-part of Ser. No. 704,639, Feb. 12, 1968, abandoned. This application July 11, 1974, Ser. No. 487,647

Int. Cl.² B29G *7/02;* **B29D** *27/00*

U.S. Cl. 425—4 R **5 Claims**



1. Apparatus for molding foamed thermoplastic articles characterized by a cellular core and a substantially non-cellular integral peripheral shell comprising:

a. extruder means adapted to flux a thermoplastic material;

b. disperser means connected to said extruder means for producing a dispersion of fluid blowing agent in the fluxed thermoplastic material comprising a cylindrical barrel having therein at least one rotatable disc dispersion unit with an alternating spaced series of perforated-solid rotating discs; said perforated disc, providing a high shear mixing zone, having outer edge surfaces in close rotating clearance with the inner walls of said barrel; the outer edge surface of said rotating disc being spaced from the inner walls of said barrel to form an intense shear mixing zone; and wherein said blowing agent is dispersed when passed through the apertures of said perforated disc and is intimately dispersed throughout the thermoplastic material when passed through said intense shear zone;

c. accumulation chamber means in communication with said disperser adapted to receive the mixture from said disperser and to maintain said mixture in the molten state and at a pressure above the foaming pressure of said mixture;

d. mold means adapted to be maintained at a pressure no greater than the pressure at which said mixture foams and expands;

e. means for establishing and terminating communication between said mold means and said accumulation means at a point wherein the pressure is above the foaming pressure of said mixture; and

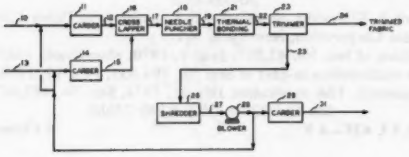
f. means connected to said accumulator for rapidly forcing said mixture out of said accumulation means and into said mold when communication is established therebetween.

3,941,530

CONVERSION OF NONWOVEN FABRIC INTO STAPLE FIBERS

Louis Platt, Seneca, S.C., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 31, 1974, Ser. No. 475,203
Int. Cl.² B29D 7/00
U.S. Cl. 425—83 **14 Claims**



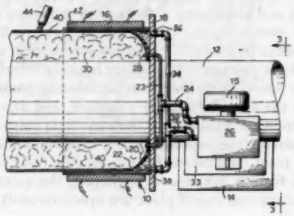
1. Apparatus suitable for shredding nonwoven fabric comprising a first shredding element having a large number of projections, each of said projections extending outwardly from a first surface of said element for a distance of at least one fourth of the thickness of the material to be shredded; a plate having a working surface; means for positioning said plate such that said working surface is adjacent said first surface of said first shredding element with the distance between the outer ends of said projections and said working surface gradually decreasing from a first value at the inlet end of said working surface to a second value at the outlet end of said working surface, said second value being less than the thickness of the material to be shredded; feeding means for supplying the material to be shredded to the opening between the inlet end of said working surface and said first surface of said element at a first rate; means for moving said first shredding element past said working surface at a second rate, said second rate being sufficiently greater than said first rate to permit said projections to at least substantially shred said material as said material passes between said first shredding element and said working surface; a second shredding element having projections extending from a first surface thereof; means for positioning said second shredding element such that a part of the first surface of said second shredding element is adjacent to and spaced from a part of the first surface of said first shredding element at a location downstream of said plate to enable projections on said first and second shredding elements to simultaneously engage the at least partially shredded material passing from said outlet end of said working surface; means for moving said second shredding element substantially slower than that of said first shredding element; a housing surrounding said first and second shredding elements and said feeding means and having at least one air inlet opening therein between said feeding means and said second shredding element to direct air on the at least partially shredded material passing from said working surface to said second shredding element; and at least one air inlet therein below said second shredding element to direct air on the shredded material passing from between said first and second shredding elements; and fan means for withdrawing air and the thus shredded material from said housing.

3,941,531

APPARATUS FOR APPLYING FOAM COATING TO PREFORMED PIPE

William D. Parker, Tulsa, Okla., assignor to Joyce Western Corporation, Andover, N.Y.

Filed Jan. 30, 1974, Ser. No. 437,766
Int. Cl.² B29F 3/10
U.S. Cl. 425—96 **10 Claims**



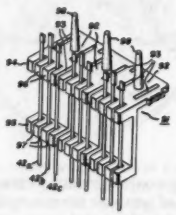
1. Apparatus for coating a preformed pipe, comprising a rigid tubular sleeve adapted to be positioned around a pipe with an annular gap between the pipe and the inner wall of said sleeve, support means for said sleeve, drive means connected to said support means for moving said sleeve longitudinally relative to said pipe, means separate from said drive means for supplying a foamable composition to fill the gap between the pipe and said sleeve as said sleeve moves along said pipe and means cooperating with the inner wall of said sleeve to apply a layer of a sealant to the external surface of foam produced from said foam forming composition while within said sleeve.

3,941,532

APPARATUS FOR MANUFACTURING SEMICONDUCTOR DEVICES

Donald W. Fennessy, Liverpool, and Harry W. Schmitz, Glens Falls, both of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed Mar. 8, 1974, Ser. No. 449,550
Int. Cl.² B28B 23/00; B22D 19/00
U.S. Cl. 425—117 **14 Claims**



1. Apparatus for manufacturing semiconductor devices comprising:

a segmented reusable lead frame having a plurality of elements, each of said elements being adapted for holding a set of lead wires, said elements being resiliently mounted with respect to each other in a linear array, said lead frame further comprising spacing adjustment means between said elements for adjusting the spacing therebetween;

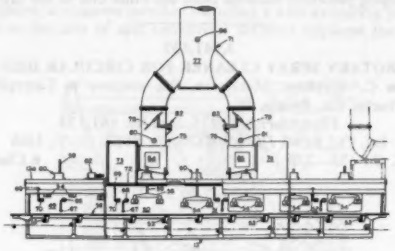
a mold defining a linear array of cup shaped mold cavities, each of said cavities being spaced to substantially align with one of said sets of lead wires; and

separate alignment means associated with each of said elements for improving the alignment of said sets of lead wires and said cup shaped mold cavities.

3,941,533
APPARATUS FOR MAKING SYNTHETIC RESIN CARPETING AND THE LIKE

John Francis Gillespie, Corona del Mar, Calif., assignor to Saguaro Industries, Inc., Kingman, Ariz.

Division of Ser. No. 285,844, Sept. 1, 1972, Pat. No. 3,896,197. This application July 23, 1974, Ser. No. 490,966
Int. Cl.[2] B29D 7/00
U.S. Cl. 425—143 7 Claims

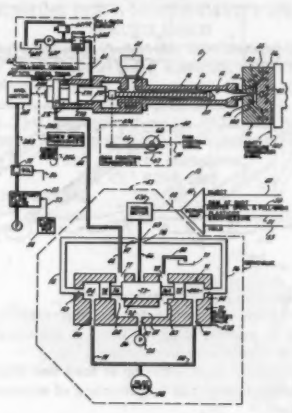


1. An apparatus for making surface coverings comprising:
a. conveyor means supported for movement within said apparatus;
b. material feed means mounted adjacent to and along the path of movement of said conveyor means, said material feed means operable to deposit particles of synthetic resin on to said conveyor means;
c. heating means mounted adjacent to and along the path of movement of said conveyor means in spaced relation to said material feed means, said heating means providing a plurality of successive temperature zones and heating said particles of synthetic resin in accordance with a predetermined temperature profile along the length of said heating means to cause said particles of synthetic resin to fuse into a mass;
i. said heating means comprising an oven assembly and a temperature control system for said oven assembly;
ii. said oven assembly including a plurality of heaters of a first type mounted in spaced relation to the path of movement of said particles of synthetic resin, and a plurality of heaters of a second type mounted in spaced relation to the path of movement of said particles of synthetic resin;
iii. said oven assembly further including means for moving said plurality of heaters of a second type in a direction normal to the path of said particles of synthetic resin;
iv. said temperature control system including temperature sensing means for sensing the temperature prevailing at a multiplicity of points within said oven assembly and along the several zones, and at least first temperature control means connected in circuit relationship with said temperature sensing means and also operatively connected to said means for moving said plurality of heaters of a second type;
v. said first temperature control means controlling the operation of said means for moving said plurality of heaters of a second type to thereby adjust the positioning of said plurality of heaters of a second type in a direction normal to the path of movement of said particles of synthetic resin in order to compensate for at least some of the deviation sensed by said temperature sensing means from the predetermined temperature for a given zone in the desired temperature profile within said oven assembly; and
d. embossing means mounted in spaced relation to said heating means adjacent to and along the path of movement of said mass, said embossing means embossing a design pattern on at least one external surface of said mass.

3,941,534
INJECTION MOLDING CONTROL SYSTEM

Denes B. Hunkar, Cincinnati, Ohio, assignor to Hunkar Laboratories, Inc., Cincinnati, Ohio

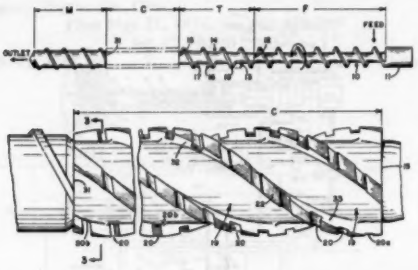
Continuation-in-part of Ser. No. 194,224, Nov. 1, 1971, Pat. No. 3,767,339. This application Oct. 19, 1973, Ser. No. 407,994
Int. Cl.[2] B29F 1/06
U.S. Cl. 425—145 13 Claims



1. In an injection molding machine having a ram screw which advances to inject a plasticized charge of material from an injection barrel into a mold cavity and retracts while rotating to accumulate a plasticized charge, a control system for said ram comprising:
a piston connected to said ram and a cylinder within which said piston moves,
a flow divider valve having an inlet connected to a source of pressure fluid, a first outlet connected to said cylinder, a second outlet connected to a fluid reservoir, and movable means to simultaneously alter the sizes of said outlets in inverse relation such that when one increases the other decreases,
a servomotor responsive to electrical signals input thereto and having an output operatively associated with said movable means for controlling the movement of said movable means in accordance with said signals,
first and second sources of electrical signals associated, respectively, with a deviation between desired and actual ram advance during the injection phase of a molding cycle and a deviation between desired and actual ram retraction during the plasticizing phase of a molding cycle,
means for connecting said first source of electrical signals to said servomotor during injection to control said movable means of said flow divider in a manner to advance the ram at a rate correlated to the fluid flow rate to said piston cylinder from said first valve outlet, and an injection pressure correlated to the size of said second valve outlet, and
means for connecting said second source of electrical signals to said servomotor during plasticization to control said movable means of said flow divider in a manner to permit said ram, when said screw rotates, to retract under a back pressure correlated to the size of said second outlet and at a rate correlated to the fluid flow from said cylinder to said first valve outlet.

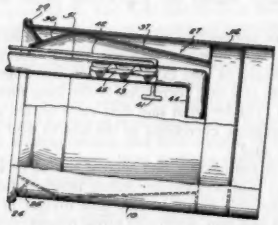
whereby said ram screw, during injection and plasticization, is continuously under control of said flow divider valve in response to electrical signals input to said servomotor, to provide the desired ram advance and retraction.

3,941,535
EXTRUSION DEVICE
Louis F. Street, 127 Belvidere Ave., Washington, N.J. 07882
Filed Oct. 1, 1974, Ser. No. 511,072
Int. Cl.² B01F *7/02*
U.S. Cl. 425—208 **8 Claims**



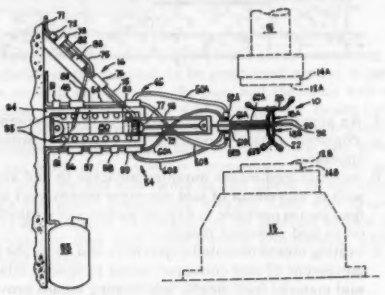
1. An extrusion device comprising
a screw extrusion member for the movement of materials within a housing directly from a transitional section through a compounding section;
said transitional section having at least one channel which is reduced in depth in the direction of movement of said materials;
and said compounding section including means for simultaneously subjecting at least the major portion of the materials from said transitional section to high shear forces and high volume separational and combinational mixing; said compounding section comprising a plurality of discrete protuberances on the screw root of said member, each separated from an adjoining protuberance by an intervening passageway and having an outer surface forming a spacing with said housing greater than 0.001 and less than 0.02 times the maximum inside diameter of said housing.

3,941,536
ROTARY DRUM PELLETIZER WITH REMOVABLE LINERS
Earl V. Akerlow, Grafton, Wis., assignor to Akerlow Industries, Inc., Grafton, Wis.
Filed May 23, 1974, Ser. No. 472,789
Int. Cl.² B29B *1/02*
U.S. Cl. 425—222 **3 Claims**



1. Pelletizing apparatus comprising a rotary drum, a series of liners each of which removably fits into said drum, each of said liners having a different configuration of internal multiple cone frustum baffles, each such configuration adapted to provide a different treatment capability for particulate material processed through the drum, interconnecting means respectively on the drum and liners for releasably fastening said liners to the drum, each of said liners having at least one ring portion longitudinally spaced from said interconnecting means and which bears against the inner surface of the wall of the drum to support its liner in the drum, and means for feeding particulate material to one end of the drum and for discharging pellitized material from the other end of the drum.

3,941,537
ROTARY SPRAY CLEANER FOR CIRCULAR DIES
John C. Abraham, Metamora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed Mar. 24, 1975, Ser. No. 561,135
Int. Cl.² B29C *1/04*; **B05C** *5/00*; **B05B** *15/10*, *3/06*
U.S. Cl. 425—228 **6 Claims**

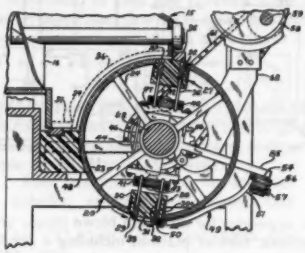


1. A molding apparatus with means for cleaning the dies thereof, comprising:
a pair of rotary unions each including a base portion, a portion upraised from said base portion, and a rotor rotatably mounted in said upraised portion and including a fluid pathway therethrough, said unions being positioned with their bases in opposed adjacent relation;
a pair of pipes each of which communicate with the fluid pathway of one of said rotors, each of said pipes ending in a nozzle;
a pair of passages, one through each of said unions, said passages each communicating with the fluid pathway of the respective rotor;
means for moving said pair of unions in and out between a pair of opening and closing dies and into position for said nozzles to each spray one of said die pair;
means for supplying a pressurized gas to each of said passages;
means for supplying a pressurized liquid to each of said passages; and
means for preventing simultaneous supply of gas and liquid to each of said passages.

3,941,538
APPARATUS FOR FORMING EDIBLE RINGS
Gerald J. Orlowski, Calumet Park, Ill., assignor to Central Soya Company, Inc., Fort Wayne, Ind.
Continuation-in-part of Ser. No. 205,031, Dec. 6, 1971, abandoned. This application June 4, 1973, Ser. No. 366,432
Int. Cl.² A21C *5/04*
U.S. Cl. 425—241 **4 Claims**

1. In apparatus for forming edible products from edible formable mass comprising in combination, a hopper containing said mass, a cylindrical member rotatably mounted about a horizontal axis and defining peripheral cavity means cooperating with said hopper for receiving a portion of said mass at

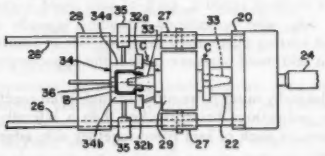
a loading station and for discharging the same at a discharge station, a movable plunger member mounted for reciprocation within said cavity means, means for reciprocating said plunger member between a retracted position when said cavity means of said cylindrical member is at said loading station for receiving said mass portion, and an extended position when said cavity means is at said discharge station for discharging said mass from said cavity means, the improvement comprising: means for extending the distal end of said plunger member a predetermined distance beyond the outer surface of said cylindrical member when said plunger member is in said extended position; a remover member including a wire extending parallel to the axis of said cylindrical member adjacent the discharge position for separating a formed product from said plunger member at said discharge station when said plunger member is reciprocated to said extended position; spacer means slidably contacting the surface of said cylindrical member for holding said wire outwardly of said cylindrical member by said predetermined distance; means for oscillating said remover member in a direction opposite to the direction of rotation of said cylindrical member when said cavity means is adjacent said discharge station, whereby said remover member removes said formed product by moving said wire in a direction opposite to the peripheral motion of said cylindrical member; and means for returning said remover member to its original position after a formed product has been moved from said plunger member.



3,941,539
INJECTION BLOW MOLDING APPARATUS AND METHOD

Robert W. Saumsiegle, Needham, and Ieuan L. Harry, Billerica, both of Mass., assignors to Continental Can Company, Inc., New York, N.Y.

Filed Dec. 5, 1972, Ser. No. 312,257
Int. Cl.² B29D *23/02, 23/03;* **B29F** *1/00*
U.S. Cl. 425—242 B **20 Claims**

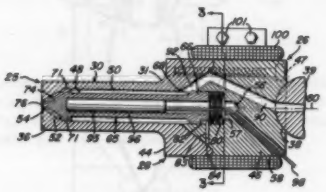


1. Blow molding apparatus comprising
a preform mold,
a partible blow mold,
a core assembly including a mounting base, a core element, partible neck mold sections surrounding the base of the core element and means mounting the neck mold sections to the mounting base for longitudinal and divergently outward movement with respect to the core element,
means for causing the core element to be alternately axially inserted in and retracted from the preform mold and the blow mold including the retraction of said core element from a finished article while the finished article is still in the blow mold, and
motor means for moving the neck mold sections longitudinally and divergently outward with respect to the core element as the core element is separated from a finished article in the blow mold.

3,941,540
SPRUE BUSHING FOR A SINGLE CAVITY OR CENTER SPRUED MOLD

James Robert Driscoll, Centerville; Earl Edward Clark, Dayton, and Thomas James Haas, Kettering, all of Ohio, assignors to Diamond Tool & Die Company, Dayton, Ohio

Continuation of Ser. No. 160,317, July 7, 1971, Pat. No. 3,767,340. This application June 14, 1973, Ser. No. 369,917
The portion of the term of this patent subsequent to Oct. 23, 1990, has been disclaimed.
Int. Cl.² B29F *1/03*
U.S. Cl. 425—245 NS **5 Claims**



1. Apparatus for injecting a plastics material into a cavity defined by a mold, comprising an injection molding machine having a nozzle member with a forward end surface, a sprue bushing projecting into the mold and including a body having a generally cylindrical rearward surface, said body being formed by a forward body section and a rearward body section, means for securing said body sections together, said rearward body section having a seat for receiving said forward end surface of said nozzle member, said forward body section having a forward end surface forming part of the mold cavity, means defining an injection orifice within said forward end surface of said forward body section, means defining a chamber extending from said orifice axially within said body, means defining a cylindrical bore extending rearwardly of said chamber and having an end surface terminating forwardly of said seat, an elongated valve member supported for axial movement within said chamber and including a forward tip portion and a rearward end portion slidably supported within said bore, said valve member being movable between a closed position with said tip portion closing said orifice and an open position with said tip portion shifted axially from said orifice, said tip portion of said valve member having an end surface positioned generally flush with said forward end surface of said forward body section when said valve member is in said closed position, a plurality of spring washers disposed within said bore adjacent said end surface for urging said valve member toward said closed position, said valve member being movable to said open position in response to a predetermined pressure of plastics material within said chamber around said valve member, means defining a plurality of angularly disposed spaced passages within said rearward body section of said sprue bushing and extending from said seat outwardly around said bore and said spring washers to said chamber for conducting plastics material from said nozzle member to said chamber, and an electrical heating band extending around said rearward surface of said body.

3,941,541

BLOW MOLDING DEVICE HAVING A BLOW MANDREL WITH A SEAL FORMING RING

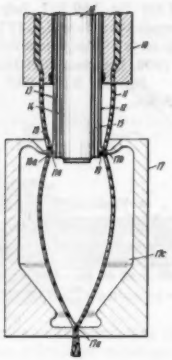
Hans Dietrich Thiele, Ettlingen, Baden, Germany, assignor to PMD Entwicklungswerk fur Kunststoff-Maschinen GmbH & Co. KG, Ettlingen, Baden, Germany

Filed May 9, 1974, Ser. No. 468,414

Claims priority, application Germany, June 22, 1973, 2331766

Int. Cl.² B29D 23/03

U.S. Cl. 425—292 2 Claims



1. A blowing device for the production of a hollow body comprising:

a hollow blow mold having a blow-mold cavity and an opening communicating with said cavity and formed with a thin sealing edge portion; and

a blowing mandrel comprising

a blow pipe axially displaceable relative to said blow mold and having at least a mouth portion adapted to extend into said cavity through said opening in a blowing position,

a sealing ring formed on said blow pipe and axially set back from said mouth portion for sealingly clamping an extruded tube against said sealing edge portion upon introduction of said tube into said cavity for blowing therein,

a circumferential groove formed in a flank of said ring turned toward said cavity for receiving a lip of material of said tube whereby said lip is pressed against a wall of said groove upon blowing of said tube in said cavity, and

a circumferential biting edge sloped in the direction of said cavity and disposed along the outer circumference of said groove, said biting edge being dimensioned such that it is spaced from said sealing edge portion in said blowing position so as to penetrate into said tube to form said lip therein without penetrating through said tube.

3,941,542

APPARATUS FOR BLOW MOLDING PLASTIC ARTICLES

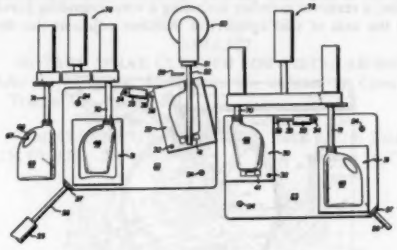
Albert R. Uhlig, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 110,685, Jan. 28, 1971, Pat. No. 3,781,395. This application Aug. 22, 1973, Ser. No. 390,551

The portion of the term of this patent subsequent to Dec. 25, 1990, has been disclaimed.

Int. Cl.² B29C 17/07

U.S. Cl. 425—326 B 4 Claims



1. In an apparatus for making a blown plastic article from a thermoplastic tubular parison, including a pre-form blow mold closable on said parison, means for inflating the parison interiorly of the pre-form blow mold to a pre-form configuration of a size less than the size of the blown plastic article, a final blow mold having an interior cavity of a size and configuration conforming to that of the final blown article, means for closing said final blow mold on the pre-form, means for axially stretching the blown pre-form, and means for inflating the blown and stretched pre-form interiorly of the final blow mold cavity to the size and configuration of the final blown article.

3,941,543

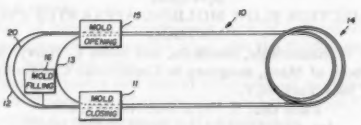
FLEXIBLE CONTINUOUS MOLD SYSTEM

Samuel S. Buonanno, Rochester, N.Y., assignor to Schlegel Corporation, Rochester, N.Y.

Filed Aug. 5, 1974, Ser. No. 494,408

Int. Cl.² B29C 15/00

U.S. Cl. 425—371 10 Claims



1. In a mold system having a pair of mold parts formed as continuous loops of resin extrusions closable along a parting plane and flexible enough to follow a curved path while closed to hold a molded product, each of said mold parts having opposite side edge projections extending laterally outward along said parting plane and fitting together in abutting relation when said mold parts are closed, the improvement comprising:

a. the laterally outer extremities of said fitted-together side edge projections being thicker than a laterally inward portion of each of said fitted-together side edge projections;

b. two continuous loops of flexible and springy retainer strip each substantially the length of said mold parts;

c. said retainer strips being formed of a springy metal element having a longitudinal pattern of side edge gaps;

d. a resin coating covering each of said retainer strips;

e. each of said retainer strips being generally U shaped in cross section to clip respectively over said side edge

projections and resiliently bias said side edge projections into said abutting relation;

f. the longitudinal edges of said retainer strips extending to said laterally inward portions of each of said side edge projections and being spaced apart by less than the thickness of said laterally outer extremities to form an interlock with said side edge projections;

g. said retainer strips being flexible transversely relative to the longitudinal extent of said retainer strips for bending around said curved path with said mold parts;

h. means arranged ahead of said curved path for clipping said retainer strips onto said closed mold parts and positioning said longitudinal edges of said retainer strips firmly against said laterally inward portions of said side edge projections to form said interlock; and

i. means arranged after said curved path for removing said retainer strips from said closed mold parts.

3,941,544

APPARATUS FOR THE PREPARATION OF FOAMED THERMOPLASTIC EXTRUDED PROFILES

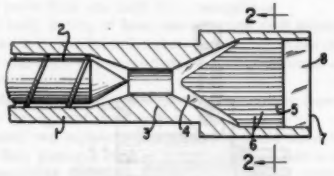
Hans Jochen Barth, Emmerting, Germany, assignor to Wacker-Chemie GmbH, Munich, Germany

Filed Oct. 9, 1973, Ser. No. 404,506

Claims priority, application Germany, Oct. 9, 1972, 2249435

Int. Cl.² B29D *7/02, 27/00;* **B29F** *3/06*

U.S. Cl. 425—376 **6 Claims**



1. An apparatus for the production of extruded profiles of foamed thermoplasts consisting of an extruder having an extrusion screw and a form-giving extruder head having a flow channel therethrough characterized in that at least part of the length of said flow channel is divided by separating walls having a thickness of 0.2 to 3 mm arranged in the axial direction into individual channels of such a length and cross-section area that each individual channel has a nozzle coefficient k of from 0.1 to 2 mm^3, said separating walls reducing the cross-section area of said flow channel by a minor amount only.

3,941,545

MEANS FOR CURVING SIDE BY SIDE CONCRETE CURB SECTIONS

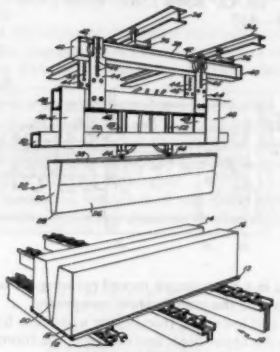
Angelo V. Beretta, and David Beretta, both of Lincoln, R.I., assignors to Durastone Company, Lincoln, R.I.

Filed Jan. 21, 1974, Ser. No. 434,987

Int. Cl.² B28B *11/00*

U.S. Cl. 425—383 **6 Claims**

1. Apparatus for bending unset pre-cast zero slump concrete curbing emerging in paired lengths in spaced parallel relation from an automatic casting machine, said curbing having inclined sides in facing relation whereby the space between each pair of curbing is substantially V-shaped, said apparatus comprising first means for simultaneously prebending each pair of curbing, said first means comprising an elongated blade-like tool having a pair of converging side walls whereby said tool is substantially V-shaped in cross section, each of said side walls having a gentle convex curvature from end to end, said tool being dimensioned so as to wedgingly engage between said pair of curbing, first means for forcing said tool inwardly between said pair of curbing whereby said convex sides automatically and simultaneously cause bending of said spaced curbing, a second tool operable after removal of said first tool from between said curbing to finalize the bend



of said curbing, said second tool comprising an elongated frame having end walls and parallel side walls curved to the desired final radius of said curbing, and second means for forcing said frame over said prebent curbing.

3,941,546

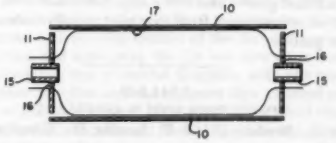
APPARATUS AND PROCESS

Martval John Hartig, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 14, 1974, Ser. No. 451,119

Int. Cl.² B29D *23/01, 23/03*

U.S. Cl. 425—387 R **3 Claims**



1. An apparatus for preparing heat-shrinkable plastic tubing by radially expanding lengths of plastic tubing to a larger diameter within a cylinder which comprises

a. a heat-resistant flexible sheet looped into cylindrical shape to form a restraint, the loop being formed by looping one end of said sheet back upon the opposite end so that a portion of the surface along one of the ends abuts a portion of the same surface of the sheet along the other end;

b. a pair of clamps extending longitudinally along the portions of the cylindrically shaped sheet which abut to form the cylinder, positioned such that the ends of the sheet which abut are between the clamps so that at least one looped end of the sheet can be moved between the clamps to a distance from said clamps on the side of the clamps opposite the cylindrical shape, and

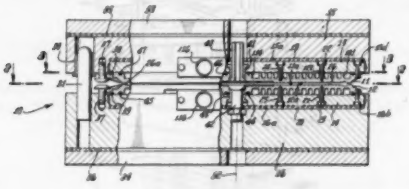
c. means located at each end of the cylindrically shaped sheet to provide (1) a pressure-tight fitting between the inside and outside of said plastic tubing, and (2) a gas conduit through the fitting.

3,941,547

PHONOGRAPH RECORD PRESSING DIE ASSEMBLY

Csaba K. Hunyar, Sunland, and Jesse Green, Torrance, both of Calif., assignors to United Artists Music and Records Group, Inc., Los Angeles, Calif.

Continuation of Ser. No. 469,387, May 13, 1974, abandoned.
This application May 12, 1975, Ser. No. 576,292
Int. Cl.² B30B 15/06; B29D 17/00
U.S. Cl. 425—407 11 Claims



1. For use in a phonograph record pressing die having upper and lower bases, the combination comprising

a. upper and lower die frames, the upper die frame attachable to the upper base, and the lower die frame attachable to the lower die base, and

b. upper and lower die faces, the upper die face attached to the upper frame, and the lower die face attached to the lower frame, the upper die face directly overlying the lower die face to press a phonograph record therebetween,

c. there being a first set of fluid passing grooves formed in at least one of the upper frame and upper face and exposed to the other thereof, and another set of heat transfer fluid grooves formed in at least one of the lower frame and lower face and exposed to the other thereof,

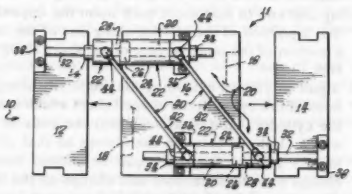
d. the grooves of each set being circular, coaxial and concentric, adjacent concentric grooves of each set being connected only by generally radial passages at multiple locations mutually relatively spaced about the groove axis, there being at least two pairs of said radial escape passages from each circular groove into the next radially outward circular groove, said two pairs being angularly offset about said axis, the pairs of escape passages from each said groove also being angularly offset from the pairs of escape passages from said next radially outward circular groove.

3,941,548

INJECTION MOLD ASSEMBLY

Robert G. Bruder, 20160 E. Juanita St., Glendora, Calif. 91740

Filed Oct. 16, 1974, Ser. No. 515,439
Int. Cl.² B29F 1/06, 1/14
U.S. Cl. 425—450.1 12 Claims



1. An injection mold assembly comprising:

a mold set including at least three mold members movable relative to one another between closed molding positions and open positions,

first hydraulic actuator means connecting a first pair of said members,

second hydraulic actuator means connecting a second pair of said members,

each actuator means comprising hollow body means containing pressure wall means forming with said body means a first hydraulic fluid chamber which expands during opening movement and contracts during closing movement of the respective member pair and a second hydraulic fluid chamber which contracts during opening movement and expands during closing movement of the respective member pair, and

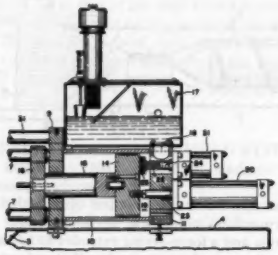
fluid conductor means connecting said actuator means in a manner such that said first chamber of each actuator means communicates with said second chamber of the other actuator means, whereby said member pairs open and close in unison.

3,941,549

RECIPROCATING SCREW INJECTION MOLDING MACHINE WITH HYDRAULIC ACTUATING MECHANISM WITH PREFILL VALVE

Arthur W. Jacobs, 5994 Columbia Road, North Olmsted, Ohio 44070

Filed June 26, 1974, Ser. No. 483,124
Int. Cl.² B29F 1/06
U.S. Cl. 425—451.2 7 Claims



1. A mold clamping mechanism for an injection molding machine comprising a mold clamping cylinder having a piston reciprocable therein in mold closing and opening directions; a prefill tank having fluid communication with said clamping cylinder via a passage having a valve member therein which opens said passage during the mold closing and opening strokes of said clamping cylinder piston for flow of fluid from said prefill tank into said clamping cylinder and vice versa; a relatively smaller actuating cylinder secured to said mold clamping cylinder and having its piston operatively secured to said clamping cylinder piston to impart mold closing and opening strokes thereto; a valve actuating cylinder secured to said mold clamping cylinder and having a piston reciprocable therein with its piston rod extending into said passage to constitute said valve member operative to open said passage during said strokes of said clamping cylinder piston for flow of fluid as aforesaid from and into said prefill tank when fluid under pressure is conducted into one end of said valve actuating cylinder, and to close said passage when said clamping cylinder piston is in mold closing position and when fluid under pressure is conducted into the other end of said valve actuating cylinder, said valve member having an orifice from said other end of said valve actuating cylinder into said clamping cylinder thereby to pressurize the fluid confined in said clamping cylinder by said valve member when closed and thus lock said clamping cylinder piston in mold closing position for injection of plasticized material into said mold.

3,941,550

APPARATUS USING SOLID INSULATING MATERIAL AS A CENTER PLATE BETWEEN MULTIPLE FLAT EXTRUSION STREAMS

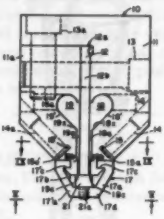
George J. Marion, 691 E. Boot Road, West Chester, Pa. 19380

Continuation-in-part of Ser. No. 223,436, Feb. 4, 1972, Pat. No. 3,797,987, which is a continuation-in-part of Ser. No. 861,047, Sept. 25, 1969, abandoned. This application Jan. 22, 1974, Ser. No. 435,496

The portion of the term of this patent subsequent to Mar. 19, 1991, has been disclaimed.

Int. Cl.² B29F *3/00*

U.S. Cl. 425—463 2 Claims



1. A die assembly for the extrusion of multiple flat films of thermo-extrudable materials for ultimate creation of materials including more than one such film, comprising:

a. a die body having at least two separate melt inlets;

b. at least two manifold chambers positioned within said die body and each in communication with a different one of said melt inlets;

c. means for separating said manifold chambers from each other throughout their extent;

d. at least two separate elongated relatively narrow first melt flow passages each in communication with a different manifold chamber for relatively coarse melt flow control;

e. at least two separate elongated relatively narrow second melt flow passages each in communication with a different first melt flow passage for relatively fine melt flow control;

f. at least two separate melt outlet slots having a relatively narrow width dimension and each communicating with a different one of said second melt flow passages, each being defined by a substantially immovable inner wall and a relatively movable outer wall;

means associated with each of said outlet slots for selectively varying the width dimension of each said slot;

h. the separation between at least one pair of melts including a plate member, including a wall of solid insulating material completely separating the respective melts within the die and retarding heat flow between them.

3,941,551

APPARATUS INVOLVING A CENTERPLATE AND A HEAT SINK BETWEEN MULTIPLE FLAT EXTRUSION STREAMS

George J. Marion, 691 E. Boot Road, West Chester, Pa. 19380

Continuation-in-part of Ser. No. 223,436, Feb. 4, 1972, Pat. No. 3,797,987, which is a continuation-in-part of Ser. No. 861,047, Sept. 25, 1969, abandoned. This application Jan. 22, 1974, Ser. No. 435,490

Int. Cl.² B29D *7/02;* B29F *3/08*

U.S. Cl. 425—463 2 Claims

1. A die assembly for the extrusion of multiple flat films of thermo-extrudable materials for ultimate creation of materials including more than one such film, comprising:

a. a die body having at least two separate melt inlets;

b. at least two manifold chambers positioned within said die body and each in communication with one of said melt inlets;

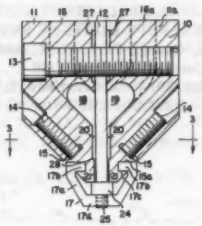
c. a center plate separating said manifold chambers from each other throughout their extent;

d. at least two separate elongated relatively narrow first melt flow passages each in communication with a different manifold chamber for relatively coarse melt flow control;

e. at least two separate elongated relatively narrow second melt flow passages each in communication with a different first melt flow passage for relatively fine melt flow control;

f. at least two separate melt outlet slots having a relatively narrow width dimension and each communicating with a different one of said second melt flow passages, each being defined by a substantially immovable inner wall and a relatively movable outer wall;

g. means associated with each of said outlet slots for selectively varying the width dimensions of each said slot;



h. the melt flow passages and melt outlet slots from them being directed so as to produce extrusion of films in a general direction which herein will be defined as the downward direction of the die and the opposite direction being defined as the upward direction of the die, with the films themselves having in cross section a longer dimension in a particular direction which herein will be defined as lengthwise of the die and the dimension of the die in that direction as the length of the die and a shorter dimension which herein will be defined as crosswise of the die, the center plate being central of the die in the crosswise direction and separating the die into two parts from the standpoint of that crosswise direction, with one manifold chamber and first and second melt flow channel on one side of that center plate and the other manifold chamber and first and second melt flow channel on the other side of the center plate;

i. heat sink slots in the upper part of the die on either side of the center plate and against the center plate, extending from slightly above the upper periphery of the manifold chambers up more than half the distance to but substantially below the top of the die.

3,941,552

BURNING WATER-IN-OIL EMULSION CONTAINING PULVERIZED COAL

Eric Charles Cottell, Windermere, Bayville, Long Island, N.Y. 11709

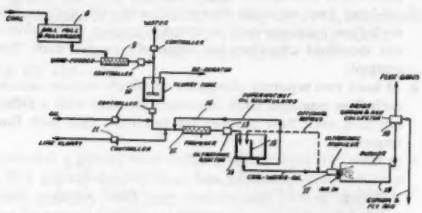
Filed Oct. 29, 1974, Ser. No. 518,509

Int. Cl.² F23B *7/00*

U.S. Cl. 431—2 6 Claims

1. A process of producing a fuel in the form of a dispersion comprising mixing of finely divided coal, with particle size less than 100μ, with water to form a slurry, adding oil to the slurry and the liquids, subjecting the mixture to violent sonic agitation with an intensity of more than 11.625 watts per cm², thus

producing a stable dispersion, whereby the coal does not settle out, removing any excess oil forming a separate phase,



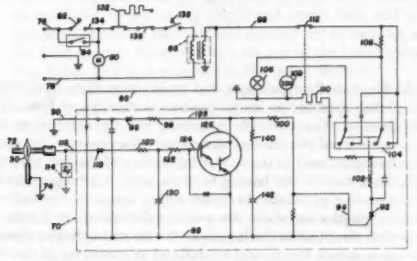
whereby a coal-water-oil dispersion is produced which is stable to storage.

3,941,553

HEATER SAFETY CONTROL SYSTEM

Robert E. Bedford, Canoga Park, Calif., assignor to Scheu Manufacturing Company, Upland, Calif.

Filed Oct. 29, 1974, Ser. No. 518,750
Int. Cl.[2] F23H 5/10
U.S. Cl. 431—80 15 Claims



1. A safety control system for use in a flame-type heater to interrupt the supply of fuel to the heater in the absence of a flame, the safety control system comprising:

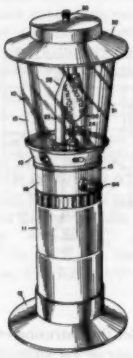
a burner assembly for developing a flame; first and second electrode means associating with said burner assembly so that an electrical circuit is completed between said first and second electrode means through and in the presence of a flame, and is interrupted in the absence of a flame; a source of electrical energy applied between said first and second electrode means; delay means for discontinuing the supply of fuel to the heater after the elapse of a predetermined interval of time from the interruption of said circuit; first switch means in the circuit of said first and second electrode means, responsive to the interruption of the electrical circuit between said first and second electrode means, taking a first operational state when said circuit is completed and a second operational state when said circuit is interrupted; and second switch means in the circuit of said first switch means and said delay means, responsive to the operational state of said first switch means, for disabling said delay means when said first switch means is in its first operational state, and actuating said delay means when said first switch means is in its second operational state to thereby commence the sensing of said predetermined interval of time.

3,941,554

COMBINATION LANTERN, REGULATOR-VALVE, AND HIGH PRESSURE PROPANE CYLINDER

Richard D. Curtis, Wichita, Kans., assignor to The Coleman Company, Inc., Wichita, Kans.

Continuation of Ser. No. 329,879, Feb. 5, 1973, abandoned.
This application July 11, 1974, Ser. No. 487,607
Int. Cl.[2] F23H 1/00; F21H 7/00
U.S. Cl. 431—89 1 Claim



1. In combination, a propane lantern and a pressure regulator assembly adapted to be connected to a source of pressurized propane fuel provided with an externally threaded fitting, said fitting defining a central bore communicating with said source and carrying a valve; the lantern having a base and a burner assembly extending above said base, the pressure regulator assembly comprising a housing defining a threaded connection receiving said burner assembly and an internally threaded recess for coupling to said threaded fitting of said source; a bottle probe carried by said housing and extending within said internally threaded recess thereof to engage and open said source valve when said pressure regulator assembly is assembled thereto, said probe defining a flow controlling orifice and a passage communicating said orifice with the interior of said housing; valve means in said housing communicating with said passage of said probe and including a core secured to said housing, a movable stem slidably received in said core and spring-biased to a closed position, and a resilient closure member carried by said stem for continuously controlled adjusting movement between a closed position at which said resilient member engages and seals said core and an opened position at which said resilient member disengages said core, positions of said resilient member intermediate said closed and opened positions adjustably controlling the flow of gas from said probe; and pressure regulator means carried by said housing and comprising flexible diaphragm means engaging said stem of said valve means; main spring means engaging said diaphragm means and urging the same to open said valve means; control means having an inner end portion with a flange end engaging said main spring means to controllably compress the same, and a continuously externally threaded portion threadedly received in said housing for controlled rotation over a plurality of turns whereby rotation of said control means member in one direction moves the inner end thereof toward said diaphragm means to increase the compression of said main spring against said diaphragm means and to open the valve means, and rotation of said control means in the other direction moves the inner end thereof away from said diaphragm means to decrease the compression of said main spring against said diaphragm means to permit the valve means to close, said valve means being movable between the closed and fully open positions by rotation of the control

means through at least a plurality of turns; and passage means in said housing at least partially defined by the side of said diaphragm means not engaging said main spring means for communicating gas passing through said valve means to said threaded connection receiving said burner assembly, whereby the pressure of gas passing through said valve means to said turner assembly is regulated and may be continuously adjusted over a range defined by said plurality of turns through which said control means may be rotated to adjust the compression of said main spring against said diaphragm means, said control means extending beyond said housing and defining a first groove at one end of said threaded portion external of said housing and a second groove within said housing at the other end of said threaded portion, said combination further comprising first and second spacer means received respectively in said grooves of said control means to engage said housing to limit the insertion and retraction of said control means; and a knob on said control means beyond said first groove to turn said control means by hand.

3,941,555

NON-SHORTING PHOTOFLASH LAMP

Robert M. Anderson, Pepper Pike, and John C. Sobieski, Novelty, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed May 6, 1974, Ser. No. 467,271
Int. Cl.² F21K *5/02*
U.S. Cl. 431—93 **7 Claims**

1. A miniature photoflash lamp comprising a bulb having an enclosed volume of less than two cubic centimeters and containing combustible metal and combustion-supporting gas, a pair of inlead conductors extending into said bulb through a base thereof, and flash ignition means connected across said inleads within said bulb, wherein the improvement comprises a support bead positioned in said bulb at a location between said base and said ignition means, said inleads extending through said support bead, said support bead having substantially flat sloping sides which slope relatively farther apart from each other toward the direction of said base and terminating at the upper edges thereof in a ridge extending from one to the other of said inlead wires, said ridge having a width no greater than the cross-section of said inleads.

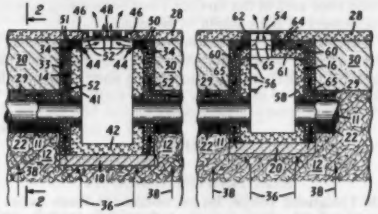
3,941,556

GAS CONTROL SYSTEM FOR A SANITARY LANDFILL

Frank Pallagi, 97-05 55th Ave., Elmhurst, N.Y. 11368

Filed Jan. 8, 1975, Ser. No. 539,284
Int. Cl.² F23D *11/00*
U.S. Cl. 431—202 **17 Claims**

1. A system for controlling gas migration in a landfill into which extends at least one substantially vertical conduit having impermeable walls connected to a substantially horizontal conduit of a utility system, the vertical conduit communicating with the atmosphere through an aperture in a pavemennt overlying the landfill, comprising means forming a space surrounding the vertical conduit and extending from the pavement into the landfill, a gas permeable medium in the vertical conduit surrounding space, and gas permeable conduit forming means disposed between the vertical conduit and the pavement communicating the vertical conduit with the aperture in the pavement, whereby gases from the landfill flow through the gas permeable medium and the gas permeable conduit forming means into the atmosphere.

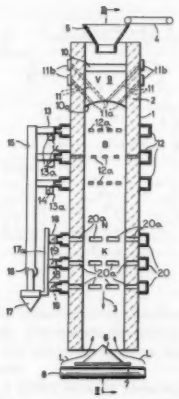


3,941,557

THERMAL TREATMENT OF GRANULAR OR LUMPY MATERIAL, PARTICULARLY FIRING LIME, DOLOMITE, MAGNESITE OR THE LIKE AND FURNACE THEREFOR

Heinrich Buchner, Niederkassel, Germany, assignor to Klockner-Humboldt-Deutz Aktiengesellschaft, Germany

Filed Dec. 23, 1974, Ser. No. 536,932
Claims priority, application Germany, Dec. 24, 1973, 2364650
Int. Cl.² F27B *15/18*; F27D *7/00*
U.S. Cl. 432—17 **19 Claims**



1. A method of thermal treatment of granular and/or lump material, and in particular for calcining of limestone, dolomite, and magnesite, or the like, in a vertical furnace provided with fuel supply means connected to burner means, and which in respect to a vertical furnace chamber passage provides a preheating zone in the upper portion of said passage, a combustion zone below the preheating zone and a cooling zone below the combustion zone and a column of material to be treated travels in a downward direction through the passage and air moves in an upward direction through the passage, comprising:

introducing material to be calcined into the top of the furnace chamber passage to descend as a column substantially filling the preheating, combustion and cooling zones;

introducing a part of the required fuel for promoting calcining combustion into the upper portion of the furnace

chamber passage and at substantially the core area of the material column under the preheating zone; and

directing the remaining fuel requirements into the combustion zone area of the furnace chamber passage toward the periphery of the column of material.

9. A method according to claim 1, including bypassing from the cooling zone to said remaining fuel requirements a part of the air which is preheated in the cooling none, and modulating the temperature of the bypass air with fresh air.

3,941,558

CONTACT-HEATING FIXING DEVICE FOR ELECTROPHOTOGRAPHY

Koichi Takiguchi, Tokyo, Japan, assignor to Rank Xerox Ltd., London, England

Filed Nov. 11, 1974, Ser. No. 522,400

Claims priority, application Japan, Feb. 19, 1974, 49-19332

Int. Cl.² F27B 9/28

U.S. Cl. 432—60 **10 Claims**

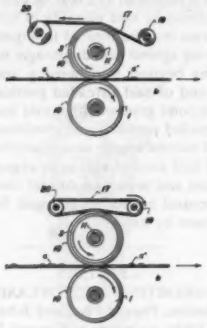
1. Fuser apparatus for fixing toner images to support members, said apparatus comprising:

a pair of nip forming members between which said support members move with said toner images contacting a heated one of said nip forming members;

means for elevating the surface temperature of said heated member to thereby render said toner images tacky;

an elongated cleaning member impregnated with offset preventing material, said elongated cleaning member comprising an endless member;

means for stationarily supporting a portion of said elongated member in intimate contact with the surface of said heated one of said members whereby said surface is simultaneously cleaned and said offset preventing material



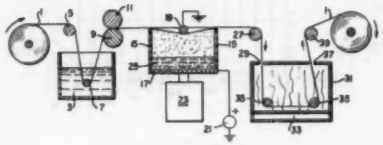
is applied to said surface; and

means for effecting movement of said elongated member whereby different portions thereof are brought into intimate contact with said surface at periodic intervals.

3,941,559
ELECTROSTATIC APPLICATION OF DYESTUFFS IN THE DRY STATE

Francis J. Cunnane, III, Glenmont, N.Y., and Elizabeth L. Word, Charlottesville, Va., assignors to Institute of Textile Technology, Charlottesville, Va.

Filed May 22, 1974, Ser. No. 472,092
Int. Cl.² D06P *5/20*
U.S. Cl. 8—2 **20 Claims**



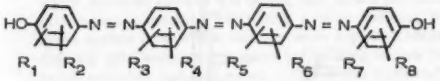
1. A process for the dyeing of a fabric, comprising the steps of:
   a. wetting the fabric by passing the fabric through a liquid bath;
   b. applying dry dyestuffs to the wet fabric; and
   c. fixing the applied dyestuffs.

3,941,560
TRISAZO POLYESTER MATERIALS

Edgar E. Renfrew, Flemington, and Dominic A. Zanella, Lock Haven, both of Pa., assignors to American Aniline Products, Inc., Paterson, N.J.

Filed Dec. 7, 1973, Ser. No. 422,864
Int. Cl.² D06P *3120;* D05P *1/18;* D06P *3/54*
U.S. Cl. 8—41 C **6 Claims**

1. A aromatic polyester fabric material dyed with a compound of the formula



wherein each of R_1, R_2, R_7 and R_8 is independently hydrogen, lower alkyl, lower alkoxy, hydroxy, chlorine or bromine; and each of R_3, R_4, R_5 and R_6 is independently hydrogen, lower alkyl, lower alkoxy, chlorine or bromine.

3,941,561
METHOD OF PRODUCING DYED MATERIAL

Ronald Barr Love, and Alistair Templeton Stewart, both of Paisley, Scotland, assignors to J & P Coats Limited, Glasgow, Scotland

Division of Ser. No. 221,831, Jan. 28, 1972, Pat. No. 3,790,342. This application July 18, 1973, Ser. No. 380,258
Claims priority, application United Kingdom, Jan. 29, 1971, 3536/71; Jan. 29, 1971, 3537/71; Apr. 3, 1971, 8623/71
Int. Cl.² D06P *1/62*
U.S. Cl. 8—92 **3 Claims**

1. A process of dyeing comprising applying to material to be dyed a solvent dyeing medium comprising a dye, a solvent of the dye selected from the group consisting of aliphatic hydrocarbons, aliphatic alcohols, halogenated aliphatic hydrocarbons, aliphatic aldehydes, aliphatic ketones, aliphatic esters, aromatic hydrocarbons, phenols, aryl halides, aromatic aldehydes, aromatic ketones, and aromatic esters and a dimethylpolysiloxane for which the solvent has a higher affinity than it has for the dye, the ratio of the dye in its solvent to the complete dyeing medium being in the range of 90 to 5% and the ratio of the material for which the solvent has a higher affinity that it has for the dye to the complete dyeing medium being in the range of 10 to 95%.

3,941,562
CORROSION INHIBITION

William Robert Hollingshad, Bethel Park, Pa., assignor to Calgon Corporation, Pittsburgh, Pa.

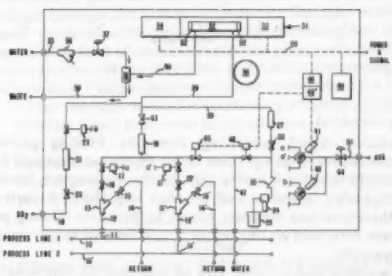
Filed June 4, 1973, Ser. No. 367,081
Int. Cl.² C23F *11/16, 11/10*
U.S. Cl. 21—2.7 R **5 Claims**

1. A method of inhibiting the corrosion of metals in a water system which comprises maintaining in the water of said system at least about 10 ppm of a composition comprising a polyacrylamide having a molecular weight of from about 500 to about 10,000 and a source of orthophosphate.

3,941,563
METHOD AND APPARATUS FOR DETECTING HEXAVALENT CHROMIUM

Robert S. Saltzman, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed Apr. 23, 1974, Ser. No. 463,309
Int. Cl.² G01N *33/18, 21/26*
U.S. Cl. 23—230 R **9 Claims**



1. A process for quantitatively determining the amount of Cr^{+6} in at least one process stream comprising the steps of:
   a. monitoring the absorbance of at least a portion of the process stream;
   b. introducing a sulfur dioxide reducing agent into at least a portion of the process stream to form a reference sample; and
   c. after a time sufficient to allow the sulfur dioxide agent to reduce Cr^{+6} to Cr^{+3}, measuring the difference in the absorbance of the process stream and the reference sample.

3,941,564
METHOD FOR ASSESSING THYROID FUNCTION

Marshall Lloyd Fader, South Bend, and Lloyd Alan Schick, Elkhart, both of Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

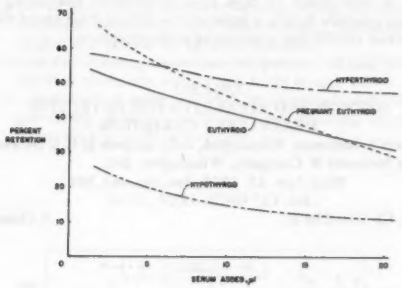
Filed Sept. 13, 1973, Ser. No. 397,118
Int. Cl.² G01N *33/16;* G21H *5/02*
U.S. Cl. 23—230 B **31 Claims**

1. A method for assessing thyroid function through the indirect determination of the free thyroxine concentration of a serum sample comprising the steps of:

a. adding to a column containing a crosslinked dextran gel at a pH of at least about 11 a first predetermined quantity of said serum sample and a quantity of a radioactive labeled thyroxine solution, whereby substantially all of the thyroxine from said first serum sample quantity becomes dissociated from endogenous thyroxine binding protein and at least a portion of both the resulting dissociated thyroxine and the radioactive labeled thyroxine from said quantity of radioactive thyroxine solution becomes bound to said crosslinked dextran gel,

b. washing said column with an aqueous alkaline solution having a pH of less than 11, whereby substantially all of the thyroxine binding protein from said first serum sample quantity is removed from said column, the pH of the crosslinked dextran gel environment is reduced to less than 11, and all of the thyroxine from said first serum sample quantity and all of the radioactive labeled thyroxine remaining in contact with said gel is bound to said gel,

c. adding to said column a second predetermined quantity of said serum sample and a predetermined quantity of an eluting liquid containing thyroxine binding protein, whereby at least a portion of the thyroxine from said first serum sample quantity and of the radioactive labeled thyroxine bound to said gel after step (b) is dissociated therefrom and becomes bound to thyroxine binding protein from said eluting liquid or said second serum sample quantity,



d. washing said column with an aqueous alkaline solution having a pH of less than 11, whereby the thyroxine from said first serum sample quantity and the radioactive labeled thyroxine which became bound to thyroxine binding protein in step (c) are sustantially completely removed from said column,

e. determining the ratio of radioactive labeled thyroxine retained in said column after step (d) to that added in step (a), and

f. comparing the ratio determined in step (e) to that obtained using a reference sample representing a known thyroid status in place of said serum sample in steps (a) and (c).

3,941,565

CLINICAL TESTING MEANS AND METHODS

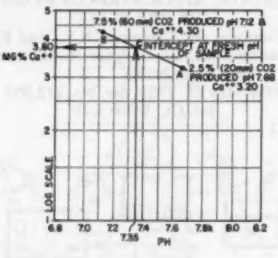
Henry D. Schwartz, 111 Ashton Ave., San Francisco, Calif. 94112

Continuation-in-part of Ser. No. 96,031, Dec. 8, 1970, abandoned. This application Jan. 2, 1973, Ser. No. 320,264

Int. Cl.² G01N *27/56, 33/16*

U.S. Cl. 23—230 B **40 Claims**

1. A method of determining approximate original ionized calcium concentration in serum taken from the body, said method comprising adjusting the pH of said serum to a specific predetermined average normal pH and then



measuring the ionized calcium concentration of said serum.

3,941,566

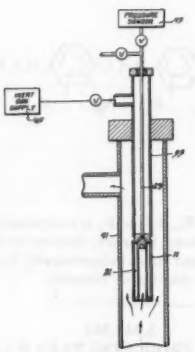
DEVICE FOR DETERMINING CARBON ACTIVITY THROUGH PRESSURE

Michael F. Roche, Lombard, Ill., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Jan. 10, 1975, Ser. No. 540,182

Int. Cl.² G01N *7/12*

U.S. Cl. 23—230 R **6 Claims**

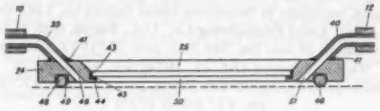


5. A method of measuring the carbon activity of a fluid having unknown carbon activity comprising: forming a layer of iron oxide on the interior wall surfaces defining an internal chamber of a sealed iron capsule; evacuating said chamber; submersing said capsule within said fluid of unknown carbon activity; and measuring the absolute pressure within said capsule internal chamber to determine the carbon activity of said fluid.

3,941,567
DEVICE FOR THE ANALYSIS OF MICROSCOPIC OBJECTS BY LASER PYROLYSIS AND CHROMATOGRAPHY IN THE GASEOUS PHASE

Andre F. Combaz, Paris, France, assignor to Compagnie Francaise des Petroles, Paris, France

Filed Dec. 17, 1973, Ser. No. 425,583
Claims priority, application France, Dec. 21, 1972, 72.45690
Int. Cl.[2] G01N *1/28, 31/08;* **G02B** *21/34*
U.S. Cl. 23—253 PC **5 Claims**



1. In an apparatus for the analysis of a microscopic specimen by pyrolysis in a hermetic chamber having,

an optical microscope having an optical axis, a total reflection prism movable between a first position on said optical axis for normal microscopic observation, and a second retracted position off said optical axis, and a platform on which a specimen will be mounted;

a micro-laser;

an ocular tube having an axis;

means for mounting said ocular tube on said microscope with said axis of said ocular tube coincident with said optical axis of said microscope;

means for mounting said micro-laser on said ocular tube so that a beam from said laser will be directed along said axes onto said specimen;

means for connecting said chamber to a supply of gas for entrainment of pyrolysis products;

a gas chromatograph;

means for connecting said gas chromatograph to said chamber;

the improvement comprising;

means providing the hermetic chamber being disposed on said microscope platform for receiving a specimen and in which pyrolysis thereof will occur, said means providing said hermetic chamber including a slide defining the lower surface onto which said specimen is placed, means defining side walls of said chamber, sealing means between said slide and said means defining side walls and a window forming the top of said chamber; and

means to clamp said hermetic chamber to said platform, said clamping means being arranged to allow movement of said slide relative to said platform.

3,941,568
APPARATUS FOR THE PRODUCTION OF ETHYLENE DICHLORIDE

Bruce E. Kurtz, Marcellus, and Anatoli Omelian, Jordan, both of N.Y., assignors to Allied Chemical Corporation, New York, N.Y.

Division of Ser. No. 145,145, May 20, 1971, Pat. No. 3,839,475. This application July 15, 1974, Ser. No. 488,627
Int. Cl.[2] B01J *1/00;* **C07C** *17/02*
U.S. Cl. 23—260 **6 Claims**

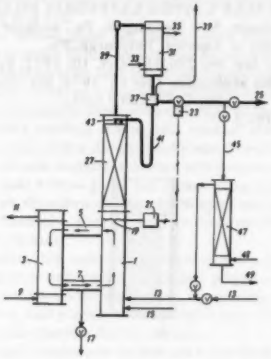
1. Apparatus for making ethylene dichloride by reacting ethylene and chlorine in a liquid reaction medium of ethylene dichloride, comprising:

a. a vertically disposed reaction vessel for effecting reaction between the ethylene and chlorine, having at least one inlet each for the ethylene and the chlorine positioned in the lower portion thereof, the reaction vessel having an upper outlet and a lower inlet for the reaction medium to be circulated therethrough, the upper outlet being located below the liquid level, the reaction vessel further having a vapor outlet located in the upper portion thereof above the liquid level;

b. indirect heat exchange means located externally of the vertically disposed reaction vessel for removing heat of reaction from the reaction medium, the indirect heat exchange means having an upper inlet and a lower outlet for the reaction medium to be circulated therethrough;

c. a conduit connecting the upper outlet of the reaction vessel with the upper inlet of the heat exchange means;

d. a conduit connecting the lower inlet of the reaction vessel with the lower outlet of the heat exchange means;



to establish a path for continuous circulation of the reaction medium through the reaction vessel and the heat exchange means predominantly caused by the thermosyphon effect generated by heat of reaction and/or the gas-lift effect induced by introduction of the reactants; and further comprising

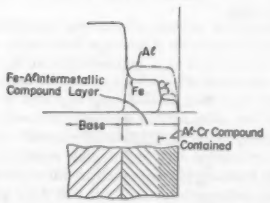
e. condensor means in communication with the vapor outlet of the reaction vessel for condensing ethylene dichloride product vapor to recover liquid ethylene dichloride product; and

f. conduit means associated with the condensor means for discharging condensed ethylene dichloride product from the apparatus.

3,941,569
METHOD FOR MAKING FERROUS METAL HAVING IMPROVED RESISTANCES TO CORROSION AT ELEVATED TEMPERATURES AND TO OXIDIZATION

Takao Sasame, and Toshio Yagi, both of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Division of Ser. No. 305,558, Nov. 10, 1972. This application June 6, 1974, Ser. No. 477,164
Int. Cl.[2] C23C *1/08, 9/00*
U.S. Cl. 29—183.5 **4 Claims**



1. A method for making ferrous metal having highly improved resistance to corrosion and oxidization, which comprises dipping a ferrous workpiece in a molten metal bath containing an aluminum alloy, which aluminum alloy contains

chromium in an amount of 1 to 10 percent by weight based on the total weight of said aluminum alloy, and having a temperature of from 750° to 930°C, for from 30 to 300 seconds, and heating the resultant ferrous workpiece for at least 30 minutes at an elevated temperature of from 700° to 930°C, thereby forming an intermetallic compound layer uniformly over the surface of said ferrous workpiece, said intermetallic compound layer containing iron and aluminum as its principle components and having a surface portion containing an aluminum-chromium compound.

3,941,570

CONICALLY CAPPED EXTRUSION BILLET

Richard Couchman, New Kensington, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Division of Ser. No. 296,013, Oct. 10, 1972, Pat. No. 3,862,286. This application July 18, 1974, Ser. No. 489,504
Int. Cl.² B32B *15/00*
U.S. Cl. 29—187.5 3 Claims

1. A composite multi-metal compacted powder extrusion billet for the high yield extrusion of selectively clad metal products comprising

a core portion of a first high density compacted metal powder of generally cylindrical configuration,

an externally cylindrically shaped sleeve of a second high density compacted metal powder of metallurgical characteristics differing from that of said first compacted metal powder disposed in encircling relation with said core portion,

a generally conically shaped terminal portion of decreasing cross-sectional dimension disposed at one end of said core portion; and

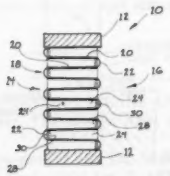
a generally conically shaped terminal portion of complementally increasing cross-sectional dimension disposed in encircling interfacially bonded relation with said terminal portion of said core member to provide a reservoir of said second metal for the cladding of the initially extruded portions of said billet.

3,941,571

FILTER PLEAT FOLD SPACER

Allan R. Getzin, Louisville, Ky., assignor to American Air Filter Company, Inc., Louisville, Ky.

Filed Apr. 7, 1975, Ser. No. 565,528
Int. Cl.² B01D *46/52*
U.S. Cl. 55—500 6 Claims



1. A filter comprising: a pleated filter media; a plurality of pleat fold spacers inserted between the flanks of the pleated filter media to hold the pleats of the filter media apart; each spacer comprising a plurality of generally parallel reduplicating corrugations and a yieldable surface along at least one edge of said spacer disposed adjacent the pleat fold turns of the pleated filter media; said yieldable surface comprising means defining a plurality of slits at spaced intervals along and open at one end to said edge of said spacer.

3,941,572

PROCESS FOR GAS-ABSORPTION AND DUST-REMOVAL

Hisashi Uchiyama; Naohiko Meno, both of Hamamatsu; Teizo Senjo, Machida, and Makio Kobayashi, Toyonaka, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka and Fuji Kasui Engineering Co., Ltd., Tokyo, both of Japan

Continuation of Ser. No. 344,502, July 25, 1972, abandoned. This application Oct. 21, 1974, Ser. No. 516,578
Claims priority, application Japan, July 25, 1972, 47-74358
Int. Cl.² B01D *47/00*
U.S. Cl. 55—90 3 Claims

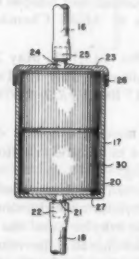
1. A process for removing a specific gas component and/or fine dust particles from a gas which comprises passing said gas containing the specific gas component and/or find dust particles upwardly through a plate tower comprising at least one perforated or grid plate without weir and downcomer, said plate having a free-space rate. (Fc) in the range from 0.25 to 0.60 and passing said gas through the tower at a superficial gas velocity within a range from 3 to 5.8 m/sec, and simultaneously passing a liquid absorbent downwardly through said plate tower at a liquid flow rate of not less than about 9300 kg/m²·hr, said liquid flow rate increasing as the free space ratio increases to not less than about 17,100 kg/m²·hr at a free space ratio of 0.60, wherein the liquid flows in a counter current flow relationship to the upflowing gas, the liquid to gas ratio (L/G) being in the range from 0.5 to 25.

3,941,573

APPARATUS FOR REMOVING ANESTHETIC GASES

James Frederick Chapel, 900 Willowood No. 2, Denton, Tex. 76201

Filed May 2, 1974, Ser. No. 466,239
Int. Cl.² B01D *50/00*
U.S. Cl. 55—316 11 Claims



1. A disposable cartridge for use in adsorbing anesthesia gases in an anesthesia system, comprising:

a cylindrical outer shell made of a disposable material including at least one perforated end member;

two filter means disposed in said shell each being adjacent one of the ends to permit the passage of a gas through said cartridge while preventing the passage of solid particles; and

at least two adsorbent fillers for adsorbing anesthesia gases disposed in said shell between said filter means so that said fillers are mixed together, one of said adsorbent fillers being substantially spherical shaped activated carbon and the other of said adsorbent fillers being molecular sieve shaped of a configuration that permits it to lie in voids between said spherical shaped fillers, said fillers being of sufficient quantity in said shell to provide for a relatively long useful life for said cartridge when used to adsorp anesthesia gases evacuated by a human patient while permitting effective evacuation of the respiratory system of such a patient.

3,941,574
METHOD OF PREPARING A GLASS BATCH FOR MELTING SILICATE GLASS

Garegin Sarkisovich Melkonian, ulitsa Barekamutiana, 26, kv. 11, and Laura Atomovna Meliksetian, ulitsa Nalbandiana, 41/1, kv. 2, both of Erevan, U.S.S.R.

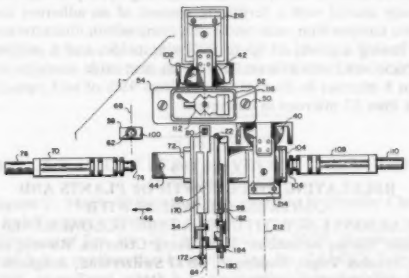
Filed May 21, 1973, Ser. No. 362,076
Int. Cl.² C03C *1/00*
U.S. Cl. 65—27 **3 Claims**

1. A method of preparing a glass batch for melting silicate glass having an SiO_2 content over 51% and a low alkali metal oxide content of up to 2% which comprises grinding batch ingredients based on rocks and mixing said ingredients with a flux comprising high-modulus calcium-magnesium hydrosilicate $x.CaO.y.MgO.n.SiO_2m.H_2O$ wherein the SiO_2:CaO.MgO ratio is from 0.5 to 8 wherein the flux is produced by mixing silica, magnesia and calcia forming materials in an aqueous medium, heating the mixture to a temperature of 50°–200°C, holding the mixture at said temperature for at least 20 minutes, filtering and drying the resulting residue consisting of a high modulus calcium magnesium hydrosilicate.

3,941,575
MULTI-ELEMENT REED CAPSULE SEALING APPARATUS AND METHOD FOR MAKING

Wayne E. Neese, Hoffman Estates, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Apr. 24, 1974, Ser. No. 463,478
Int. Cl.² C03C *27/02*
U.S. Cl. 65—59 A **12 Claims**



1. Apparatus for aligning and transferring a plurality of reedblade switch contact members to be assembled into a reed capsule switch, comprising:

bottom reedblade transfer fixture means for aligning and temporarily holding reedblade contact members, said fixture means having one or more reedblade contact member receiving slots disposed about an axis and aligned with the desired assembled position of said contact members, one slot for each of the pairs of contact members in said reed capsule switch,

reedblade loader arm means having an upper and a lower reedblade contact member receiving slot for each of the contact member pairs in said reed capsule switch, each of said upper and lower slots having a contact member receiving recess and one or more parts therein selectively connectable to a vacuum source and a source of pressurized air, said reedblade loader arm means being movable from a position where its slot axis is aligned with that of said bottom reedblade transfer fixture means to a position where it is not,

movable hollow guide pin means within said bottom reedblade transfer fixture means, one for each slot therein and aligned therewith, said guide pin means being selectively movable between a retracted position wherein said slots are substantially flush with the edge of the slots and an extended position where said contact members extend above said slots a distance sufficient to partially enter the slots of said reedblade loader arm means aligned therewith, said hollow guide pin means being adapted to conduct air therethrough thereby to eject said contact members from the slots of said bottom reedblade transfer fixture means.

5. A method for assembling, aligning and transferring to a movable loader arm means in aligned position a plurality of reedblade switch contact members, comprising the steps of:

assembling said plurality of reedblades into slots in a bottom reedblade transfer fixture means,

moving said loader arm means over said bottom reedblade transfer fixture means to a position where all of the bottom reedblade receiving slots of each means are aligned,

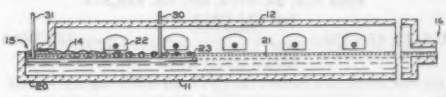
moving each of said reedblades partly out of the slots in said bottom reedblade transfer fixture means and partly into said bottom reedblade receiving slots of said loader arm means, and

pneumatically completing the movement of said reedblades out of the slots in said bottom reedblade transfer fixture means and into said bottom reedblade receiving slots of said loader arm.

3,941,576
METHOD AND APPARATUS FOR MAKING MOLTEN GLASS WITH BATCH GUIDING MEANS

Wright M. Welton, Jr., Paw Paw, W. Va., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 29, 1974, Ser. No. 528,374
Int. Cl.² C03B *5/16*
U.S. Cl. 65—135 **13 Claims**



1. In a continuous process for making molten glass of the type wherein glass batch material is introduced into a melting furnace through an inlet opening at an end wall of the furnace and molten glass is withdrawn from the furnace through an outlet opening which is spaced from said inlet opening in a longitudinal direction, whereby molten glass and batch materials within the furnace continually progress generally in the longitudinal direction along a flow path defined by an opposed pair of sidewalls in the furnace, the introduction of the batch material being such that the batch is deposited onto the surface of the molten glass within the furnace across less than the full width of the furnace so as to maintain on the molten glass a substantially continuous blanket of batch material which extends longitudinally from the inlet end to a point intermediate said inlet end and said outlet and which is initially spaced

from the sidewalls of the furnace, said blanket continually progressing along the furnace in the longitudinal direction while being melted, wherein portions of said blanket have a tendency to drift laterally toward the sidewalls, the improvement comprising:

preventing the batch blanket from laterally drifting into contact with the sidewalls as it progresses longitudinally by maintaining between each sidewall and the respective side of the batch blanket a substantially horizontally and longitudinally extending barrier submerged slightly below the surface of the molten glass along at least 30 percent of the length of the batch blanket so that movement of the batch blanket in the longitudinal direction is essentially unimpeded but lateral drifting onto the sidewalls is thereby obstructed, and holding said barriers in place by means of separate support members extending into the furnace so that said barriers are retained wholly within the confines of the furnace.

5. A furnace for the continuous production of molten glass comprising:

an enclosure for holding a volume of molten glass, including an inlet end wall, an outlet opening displaced from said inlet end wall in a longitudinal direction, a pair of opposed sidewalls defining a flow path for the molten glass from said inlet end wall toward said outlet opening, and an inlet opening at said inlet end wall through which glass batch material may be introduced onto the molten glass as a substantially continuous batch blanket spaced from the sidewalls and free to progress in the longitudinal direction toward said outlet opening;

a plurality of burner ports spaced longitudinally along said enclosure adapted for melting the longitudinally progressing glass batch prior to its arrival at the outlet opening;

a pair of spaced apart, substantially horizontally and longitudinally extending barriers supported wholly within said enclosure with their downstream ends located at least as far downstream as the region opposite the first of said burner ports from the inlet end, each barrier having a length at least as great as 30 percent of the distance from said inlet opening to said first burner port, said barriers supported at an elevation such that they serve as obstacles against lateral drifting of the batch blanket onto the sidewalls as it progresses longitudinally; and

support members extending into said enclosure, engaging said barriers, and holding the barriers in place.

3,941,577

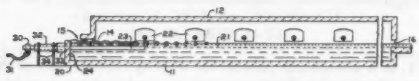
METHOD AND APPARATUS FOR MAKING MOLTEN GLASS

Ronald L. Schwenninger, Cumberland, Md., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 29, 1974, Ser. No. 528,373

Int. Cl.² C03B 5/16

U.S. Cl. 65—136 **18 Claims**



1. In a continuous process for making molten glass wherein glass batch material is introduced into a fuel-fired furnace through an inlet opening at an end wall of the furnace to form a blanket of unmelted batch on the surface of a pool of molten glass within the furnace, the batch material being deposited onto less than the full width of the pool of molten glass so as to form a blanket covering less than the full width of the pool of molten glass and extending longitudinally into the furnace from the inlet end toward an outlet at the opposite end, the improvement comprising generating additional heat beneath the batch blanket by passing electric current through a region of the molten glass between a pair of longitudinally extending electrodes, said region being spaced from the sidewalls of the furnace and closely adjacent to the underside of at least 30% of the length of the batch blanket, said electrodes extending along, and closely adjacent to, the sides of the batch blanket near the surface of the pool of molten glass so as to maintain the batch blanket spaced from the sidewalls of the furnace.

5. A furnace for the continuous production of molten glass comprising:

an enclosure for holding a volume of molten glass provided with an inlet opening at an end wall, through which glass batch material may be introduced onto the molten glass, and a longitudinally displaced outlet opening through which molten glass may be withdrawn;

a plurality of burner ports spaced longitudinally along said enclosure for melting the glass batch; and

a pair of transversely spaced, elongated electrodes extending substantially horizontally and longitudinally through said inlet end wall beneath said inlet opening into said enclosure at least as far as the region opposite the first of said burner ports from the inlet end.

3,941,578

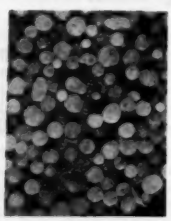
ZINC OXIDE COATED UREA

Gerald L. Tucker, and Elmer Ladelle Blanton, both of Yazoo City, Mich., assignors to Mississippi Chemical Corporation, Yazoo City, Miss.

Filed Sept. 23, 1971, Ser. No. 183,018

Int. Cl.² C05C 9/00; C07C 126/00

U.S. Cl. 71—28 **9 Claims**



1. A fertilizer composition comprising urea particles uniformly coated with a fertilizing amount of an adherent zinc oxide composition, said zinc oxide composition characterized by having a purity of 95 to 99% zinc oxide, and a uniform particle size, with at least 90% of the zinc oxide particles less than 8 microns in diameter and at least 98% of said particles less than 37 microns in diameter.

3,941,579

REGULATING THE GROWTH OF PLANTS AND CONTROLLING WEEDS WITH CARBONYL-SUBSTITUTED AZABICYCLOALKANES

Elmar Sturm, Arlesheim; Hans Joerg Cellarius, Riehen, and Christian Vogel, Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

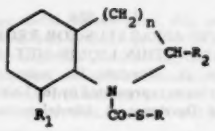
Division of Ser. No. 216,778, Jan. 10, 1972, Pat. No. 3,776,912. This application Sept. 10, 1973, Ser. No. 395,885

Claims priority, application Switzerland, Jan. 14, 1971, 553/71

Int. Cl.² A01N 9/22

U.S. Cl. 71—94 **11 Claims**

1. A herbicidal composition which comprises (1) a herbicidally effective amount of a compound of the formula



wherein R is chloroalkyl having 2 or 3 carbon atoms or a straight chain or branched alkenyl having 3 or 4 carbon atoms, one of R_1 and R_2 is hydrogen and the other is hydrogen or methyl, and *n* is the number 1 or 2 and (2) an inert carrier.

3,941,580

HERBICIDAL COMPOSITIONS

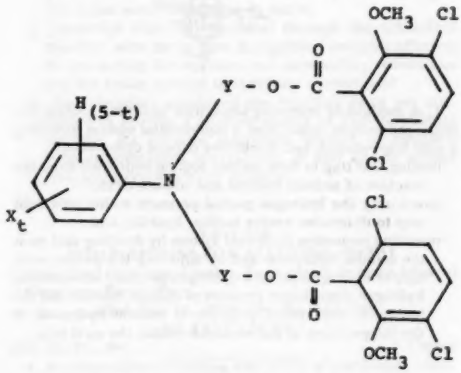
Takeo Hokama, Chicago, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Division of Ser. No. 383,932, July 30, 1973, Pat. No. 3,890,373. This application Jan. 8, 1975, Ser. No. 539,371

Int. Cl.² A01N 9/20

U.S. Cl. 71—107 **4 Claims**

1. A herbicidal composition comprising an inert carrier and, as an essential active ingredient, in an amount toxic to weeds, a compound of the formula



wherein X is lower alkyl; *t* is an integer from 0 to 3; and Y is a straight or branched alkylene chain of from 2 to 3 carbon atoms.

3,941,581

META-BIS ANILIDE DERIVATIVES AND THEIR UTILITY AS HERBICIDES

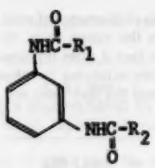
Eugene G. Teach, El Cerrito, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 20,104, March 16, 1970, abandoned, which is a continuation-in-part of Ser. No. 741,267, July 1, 1968, abandoned, which is a continuation-in-part of Ser. No. 659,865, Aug. 11, 1967, abandoned. This application Sept. 9, 1971, Ser. No. 179,224

Int. Cl.² A01N 9/20

U.S. Cl. 71—118 **24 Claims**

1. A method for controlling the growth of vegetation which comprises applying to the area where control of said vegetative growth is desired, a growth controlling amount of a compound having the formula



in which R_1 and R_2 are independently selected from the group consisting of alkyl containing from 1 through about 10 carbon atoms, inclusive, and lower alkenyl.

3,941,582

DIRECT REDUCED IRON

Jesse J. Baum, 10419 Kelso Drive, Sun City, Ariz. 85351

Continuation-in-part of Ser. No. 841,181, June 12, 1969, which is a division of Ser. No. 591,997, Nov. 4, 1966. This application June 15, 1973, Ser. No. 370,503

Int. Cl.² C22B 1/245

U.S. Cl. 75—4 **9 Claims**

1. A process for forming high density metal briquettes of reduced size comprising the steps of:

intermixing finely divided metal ore concentrate, wherein said metal is selected from the group consisting of iron, copper, manganese, and chromium, with finely divided carbonaceous reductant thermosetting binder having a low volatile content consisting essentially of 1 to 20% of a material taken from the following group: coal tar pitch or gilsonite,

compressing the intermixture of the next previous step to form compact briquettes ranging approximately in size from 2 or more inches in diameter by 2 or more inches in height,

heating the compact briquettes in a first heating step to a sufficiently high temperature ranging from approximately 350° to approximately 550°F. to caramelize the reductant binder to form handleable, tough, hard briquettes but insufficiently high temperature to initiate chemical reaction between the reductant binder and the metal ore concentrate and to destroy the adhesive properties of the reductant binder, and

further heating and shrinking the hard, handleable briquettes formed in the first heating step by subjecting same to a temperature ranging from approximately 1,900°F. to approximately 2200°F. in a substantially non-oxidizing atmosphere to permit approximately more than 90% reduction of the ore by the binder in the formation of a shrunken, highly dense, metal mass.

3,941,583

ILMENITE COATED PELLET AND PROCESS FOR REDUCING SAME

Anwyn Margaret Martin, Prahran; Donald Fergusson Stewart, Doncaster, and Andrew Baikie Swanson, North Balwyn, all of Australia, assignors to ICI Australia Limited, Melbourne, Australia

Filed Nov. 26, 1973, Ser. No. 419,103

Claims priority, application Australia, Dec. 4, 1972, 1484/72; Mar. 2, 1973, 2463/73; June 12, 1973, 3613/73

Int. Cl.² C22B 1/245, 34/12

U.S. Cl. 75—4 **11 Claims**

1. A coated pellet comprising a core consisting of a suitable mixture for a metallurgical reductive process and a coke matrix skin substantially surrounding the core, the core comprising an ilmenite ore, solid carbonaceous material capable of reducing the iron oxide in ilmenite to metallic iron and a flux chosen from the group consisting of alkali metal chlorides, alkaline earth metal chlorides and mixtures thereof; the weight ratio of ore to flux being in the range from about 5:1 to 1.2:1 the diameter of the core being in the range from 0.25

to 5 cms and the ratio of diameter of core to thickness of coke matrix skin being in the range from 10:1 to 10:3 said skin being in such a state that it does not crack or collapse under thermal stress thereby retaining its physical identity during reductive roasting, and the flux does not exude from the pellet.

3,941,584

PRODUCTION OF REFLECTIVE METAL FLAKE PIGMENTS

John Hayes Tundermann, Goshen, and John Herbert Harrington, Warwick, both of N.Y., assignors to The International Nickel Company, Inc., New York, N.Y.

Continuation of Ser. No. 293,446, Sept. 29, 1972, abandoned, which is a division of Ser. No. 94,333, Dec. 2, 1970, Pat. No. 3,709,439. This application June 19, 1974, Ser. No. 480,758
Int. Cl.[2] B22F 9/00
U.S. Cl. 75—.5 R 9 Claims

1. A metal flake powder consisting essentially of solid opaque flakes of metal each flake having a thickness of less than one micron; said flakes having essentially smooth, defect free, mechanically formed faces with major dimensions of about 10 to 40 microns; said powder being capable of being formed as a water floated layer and exhibiting, when formed as a water floated layer of minus 325 mesh particles a high specular reflectance of at least 30 percent as measured by aiming a beam of parallel light rays generated by a tungsten filament light source at an angle of 30° from the vertical and detecting the specularly reflected light, as affected by the absorption characteristics of the material tested, by a photo cell sensitive in the range of 300 to 700 millimicrons wavelength; and said metal flakes being coated with a thin lubricant film adapted to provide leafing characteristics to said flakes when said lubricant film is not wetted by a coating composition vehicle and to provide non-leafing characteristics to said flakes when said lubricant film is wetted by a coating composition vehicle.

3,941,585

PROCESS FOR COOLING SLAG AND INHIBITING POLLUTANT FORMATION

Karl V. Hauser, Ann Arbor, and Lewis A. Paulsen, Belleville, both of Mich., assignors to Edward C. Levy Company, Detroit, Mich.

Filed Feb. 19, 1971, Ser. No. 117,057
Int. Cl.[2] C21B 3/08
U.S. Cl. 75—24 20 Claims

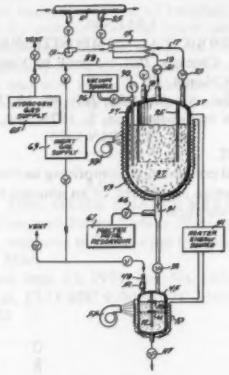
1. A process for cooling sulfur-bearing blast furnace slag molten at an elevated temperature and simultaneously inhibiting the liberation of hydrogen sulfide, comprising the steps of mixing a water soluble oxidant with cooling water, said oxidant being a substantially more readily reactive oxidizing agent than the oxygen inherently entrained in said cooling water, the concentration of oxidant being sufficient to inhibit to a major degree the release of hydrogen sulfide from the slag, and bringing slag into contact with said solution of oxidant and water so as to cool the slag sufficiently for handling, said oxidant inhibiting the release of hydrogen sulfide from the slag.

3,941,586

METHOD AND APPARATUS FOR REGENERATING COLD TRAPS WITHIN LIQUID-METAL SYSTEMS

John M. McKee, Jr., Hinsdale, Ill., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed May 29, 1975, Ser. No. 581,612
Int. Cl.[2] C22B 27/00
U.S. Cl. 75—66 12 Claims



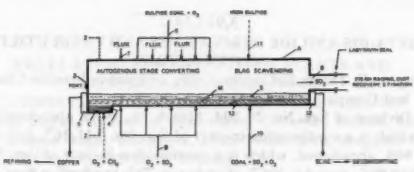
1. A method of removing impurities including sodium hydride and sodium oxide from a liquid-metal system including a cold trap wherein said impurities deposit comprising:
heating said trap to form molten sodium hydroxide from the reaction of sodium hydride and sodium oxide;
monitoring the hydrogen partial pressure within said cold trap to determine excess sodium hydride; and
removing impurities from said system by draining said molten sodium hydroxide and by adjusting the partial pressure of hydrogen gas to a hydrogen pressure between the hydrogen dissociation pressure of sodium hydride and the hydrogen dissociation pressure of sodium hydroxide at the temperature of the materials within the cold trap.

3,941,587

METALLURGICAL PROCESS USING OXYGEN

Paul E. Queneau, Cornish, N.H., and Reinhardt Schuhmann, Jr., West Lafayette, Ind., assignors to Q-S Oxygen Processes, Inc., Portland, Maine

Filed May 3, 1973, Ser. No. 357,012
Int. Cl.[2] C22B 15/00
U.S. Cl. 75—72 12 Claims



1. A continuous process for recovering metal values from non-ferrous metal sulfide concentrates wherein a molten bath comprising a metal-rich phase and a slag phase is established and maintained beneath a sulfur dioxide-containing gaseous phase, in an elongated tiltable refractory-lined sealed furnace into which concentrates, flux and an oxidizing gas are intro-

duced while value metal-rich material, slag and off-gases are separately removed, and wherein prior to removal from said furnace the slag is subjected to a cleaning treatment to reduce the value metal content thereof, characterized in that

a. the concentrates treated are selected from the group consisting of copper, nickel, cobalt and lead and combinations thereof;
b. the metal-rich and slag phases are withdrawn from opposite ends of the furnace whereby said phases are caused to flow countercurrent to each other throughout in substantially continuous lineate streams toward their respective outlets;
c. oxygen is introduced in gas concentrations and amounts effective to render the process autogenous;
d. at least a substantial portion of the oxygen introduced is blown upwardly into the molten bath, through several independently regulated subsurface injectors distributed lengthwise of said furnace along a substantial portion of the molten bath;
e. the solid feed materials are introduced stagewise into said furnace through several independently regulated feeders distributed lengthwise of said furnace along a substantial portion of the molten bath;
f. the sites and rates of introduction of oxygen and solid feed materials are located and regulated to provide a gradient of oxygen activity in the molten bath decreasing progessively and sequentially from a maximum effective for producing value metal-rich material of low iron content at its outlet to a minimum effective for producing slag of low value metal content at its outlet;
g. protective fluid is introduced through the subsurface injectors with the oxygen in regulated amounts effective for protecting the injectors and surrounding refractories and for aiding process temperature control; and
h. the subsurface combined gas injection rates are controlled to provide a minimal degree of bath turbulence effective for intimate interphase contact of reactants without substantial interruption of said lineate stream flow and oxygen activity gradient.

3,941,588

COMPOSITIONS FOR ALLOYING METAL

Charles Earl Dremann, Chester, Pa., assignor to Foote Mineral Company, Exton, Pa.

Filed Feb. 11, 1974, Ser. No. 441,288
Int. Cl.² C22B 9/12
U.S. Cl. 75—94 **8 Claims**

1. A composition consisting essentially of particulate alloying metal selected from the group consisting of manganese, manganese alloys, chromium, and chromium alloys, substantially all of which is minus 14 mesh, particulate phenolic resin, and a flux which forms a molten phase at the temperature of molten aluminum, the alloying metal constituting about 90 to about 97% and the flux about 3 to about 10% of the total weight of alloying metal and flux, and the ratio of the total volume of the alloying metal and flux to the volume of phenolic resin being in the range from about 2:1 to about 16:1.

3,941,589

ABRASION-RESISTANT REFRIGERATION-HARDENABLE WHITE CAST IRON

Telfer E. Norman, Lakewood, Colo., and Douglas A. Stolk, Holland, Mich., assignors to Amax Inc., New York, N.Y.

No Drawing. Filed Feb. 13, 1975, Ser. No. 549,553
Int. Cl.² C22C 38/20, 38/38
U.S. Cl. 75—125 **7 Claims**

1. An abrasion-resistant refrigeration hardenable white cast iron consisting essentially of about 2.5% to about 3.5% carbon, about 12% to about 22% chromium, about 1.5% to about 3.0% molybdenum, about 2.5% to about 3.5% manganese, about 1.0% to about 2.0% copper, about 1% to about 2% silicon, and the balance iron together with incidental impurities and normal residual elements present in the usual amounts.

3,941,590

PRECIPITATION HARDENING NI BASE ALLOY

Rikizo Watanabe, Yasugi, Japan, assignor to Hitachi Metals, Ltd., Japan

Filed Aug. 5, 1974, Ser. No. 494,904
Claims priority, application Japan, Aug. 8, 1973, 48-88389
Int. Cl.² C22C 19/05
U.S. Cl. 75—171 **11 Claims**

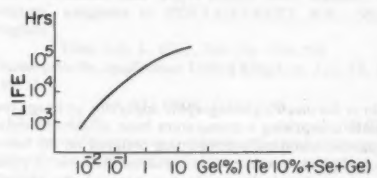
1. A precipitation hardening Ni base alloy consisting essentially of not more than 0.2% by weight of C, 17 to 19% by weight of Cr, 3.5 to 4.5% by weight of Mo, 5 to 7% by weight of W, 5 to 15% by weight of Co, 1.75 to 2.25% by weight of Al, 2.0 to 3.5% by weight of Ti, not more than 0.02% by weight of B, not more than 0.3% by weight of Zr and the balance of Ni except incidental impurities.

3,941,591

ELECTROPHOTOGRAPHIC PHOTOCONDUCTIVE MEMBER EMPLOYING A CHALCOGEN ALLOY AND A CRYSTALLIZATION INHIBITING ELEMENT

Hiroshi Hanada, Yokohama; Nobuo Kitajima, Akishima, and Tatsuo Masaki, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 280,223, Aug. 14, 1972, abandoned, which is a continuation of Ser. No. 3,050, Jan. 15, 1970, abandoned. This application Oct. 30, 1974, Ser. No. 519,277
Claims priority, application Japan, Jan. 22, 1969, 44-4633; Aug. 23, 1969, 44-67004
Int. Cl.² G03G 5/082
U.S. Cl. 96—1.5 **6 Claims**



1. An electrophotographic photoconductive member characterized by having as a photoconductive layer an amorphous alloy consisting essentially of chalcogen elements selected from the group consisting of Se-Te and Se-Te-S, and at least one crystallization inhibiting element selected from the group consisting of silicon and germanium in an amount of 10 wt % or less based on the chalcogen elements, wherein said photoconductive layer has a volume resistivity of more than 10^{12} Ω-cm. in the dark.

3,941,592

ELECTROPHOTOGRAPHIC METHOD OF TRANSFERRING TONER IMAGE

Hidetoshi Kawabata, Tondabayashi, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 20, 1973, Ser. No. 389,850
Claims priority, application Japan, Sept. 1, 1972, 47-87631
Int. Cl.² G03G 13/16, 13/22
U.S. Cl. 96—1.4 **5 Claims**

1. An electrophotographic copying method comprising the steps of producing a latent electrostatic image of an original on a front surface of a light transmitting first photo-conductive substrate, applying a toner to said image to form a separable toner image, applying an electrical charge of the polarity of said latent image to a front surface of a second photo-conductive substrate, bringing said front surfaces of said first and

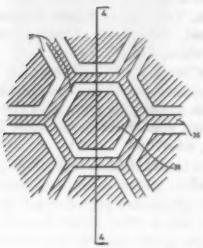
second substrates into close confrontation and exposing the rear surface of said first substrate to light to form an electrostatic latent image corresponding to said toner image on said second substrate and simultaneously transferring said toner image thereonto, separating said substrates and applying a toner to said toner image bearing surface of said second substrate.

3,941,593

ELECTRO-PHOTOGRAPHIC METHOD AND ELEMENT

William Alan Stewart Butement, 5A Barry St., Kew, Victoria, Australia

Filed Nov. 22, 1972, Ser. No. 308,700
Claims priority, application Australia, Sept. 12, 1971, 7367/71; Aug. 18, 1972, 142/72
Int. Cl.² G03G 5/04, 13/22
U.S. Cl. 96—1.5 8 Claims



1. In or for electro-photographic apparatus an image receiving plate comprising a transparent base, a layer of optically transparent, electrically conducting material on the base and a layer of photo-conductive material on the layer of optically transparent, electrically conducting material, the photo-conductive layer being coated with metal and the surface of the metal being treated to form a number of discrete areas of metal each of which is surrounded by and spaced from further metal which is in the form of a mesh the said mesh being continuous.

3,941,594

ELECTROPHOTOGRAPHIC ELEMENT WITH ZNO AND TiO_2

Satoru Honjo, Tokyo, and Hajime Miyatuka, Asaka, both of Japan, assignors to Rank Xerox Ltd., London, England

Continuation of Ser. No. 178,223, Sept. 7, 1971, abandoned. This application July 25, 1973, Ser. No. 382,437
Claims priority, application Japan, Sept. 9, 1970, 45-79021
Int. Cl.² G03G 5/08
U.S. Cl. 96—1.8 5 Claims

1. A photosensitive member for electrophotographic use having a photosensitive binder layer comprising

a. zinc oxide and titanium dioxide photoconductive particles blended in a ratio of about 50:50 to 80:20 by weight and homogeneously dispersed into

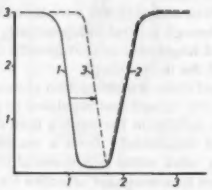
b. a film forming insulating resin binder, the particles having an average size of about 0.05 micron-to-1.0 micron and the zinc oxide and titanium dioxide particles differing in light sensitivity by a factor of more than about 1.2 based on a gray filtered mean daylight source.

3,941,595

PHOTOGRAPHIC MATERIAL CONTAINING FOGGED, DIRECT POSITIVE SILVER HALIDE EMULSION AND NEGATIVE SILVER HALIDE EMULSION FOR THE PRODUCTION OF EQUIDENSITIES

Erwin Ranz; Otto Lapp, both of Leverkusen; Erik Moisar, Cologne, and Harald von Rintelen, Leverkusen, all of Germany, assignors to AGFA-Gevaert, A.G., Bayerwerk, Germany

Filed Nov. 20, 1972, Ser. No. 308,119
Claims priority, application Germany, Nov. 20, 1971, 2157636
Int. Cl.² G03C 1/76, 1/28, 5/04
U.S. Cl. 96—27 E 10 Claims



1. A photographic material capable of recording equidensity images containing at least two silver halide emulsions as a mixture in one layer, wherein one silver halide emulsion is a fogged direct-positive silver halide emulsion having developable fog on the silver halide grain surface and which yields a positive characteristic curve and the other silver halide emulsion is a negative silver halide emulsion which yields a negative characteristic curve, the sensitivity of the negative emulsion is lower,

or is capable of being reduced by altering the composition of the light to which it is exposed so as to be lower,

than the sensitivity of the direct-positive emulsion, so that the positive characteristic curve of the direct-positive emulsion and the negative characteristic curve of the negative emulsion do not overlap, the gap between the negative and positive characteristic curve representing the equidensity image.

7. Process for the production of equidensity images including the steps of imagewise exposing to a subject a photographic material containing at least two silver halide emulsions as a mixture in one layer, wherein one silver halide emulsion is a fogged direct-positive silver halide emulsion having developable fog on the silver halide grain surface and which yields a positive characteristic curve and the other silver halide emulsion is a negative silver halide emulsion which yields a negative characteristic curve, the sensitivity of the negative emulsion is lower,

or is capable of being reduced by altering the composition of the light to which it is exposed so as to be lower,

than the sensitivity of the direct-positive emulsion,

and the said exposure to light being carried out with or without altering the intensity of the light in the sensitivity range of the direct positive or negative emulsion so that the direct-positive emulsion has a higher sensitivity to light on exposure than the negative emulsion,

so that the positive characteristic curve of the direct-positive emulsion and the negative characteristic curve of the negative emulsion do not overlap, developing the exposed material in an aqueous developer bath and subsequently fixing, washing and drying the developed image-bearing material.

3,941,596

THERMOGRAPHIC PROCESSES USING POLYMER LAYER CAPABLE OF EXISTING IN METASTABLE STATE

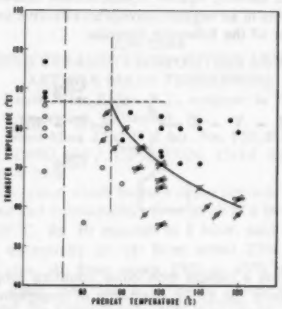
Robert Bernard Heiart, Middletown, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 141,211, May 7, 1971, Pat. No. 3,833,441, which is a continuation-in-part of Ser. No. 232,678, Oct. 24, 1962, abandoned. This application May 29, 1974, Ser. No. 474,437

The portion of the term of this patent subsequent to Sept. 3, 1991, has been disclaimed.

Int. Cl.² B44C *1/00*; G03C *5/24*, *11/12*, *5/16*

U.S. Cl. 156—234 11 Claims



1. An image-forming process which comprises

1. heating, imagewise, to a temperature above a softening temperature T_2, but below the thermal decomposition temperature thereof, a layer that is solid at normal pressure below 40°C. comprising a mixture of a thermoplastic, amorphous, organic polymer of a molecular weight above 10,000 and a normally liquid plasticizer therefor, said mixture being capable of existing
   a. in a metastable state at 20°C. having a softening temperature T_1, and
   b. in a stable state at 20°C. and having a softening temperature T_2 at least 10°C. above T_1 while said polymer is in the latter stable higher softening state, for a period sufficient to convert the stable polymer to the metastable state,
2. bringing the entire surface of the layer to a temperature T between temperatures T_1 and T_2, whereby the imagewise heated areas are softened and and will adhere to surfaces, and the remaining areas are firm and non-adherent, and
3. converting the softened, exposed image areas to a visible image by adhering to them finely divided particles or the surface of a separate image-receptive element to which said exposed image areas are transferred.

3,941,597

APPLICATION OF PROTECTIVE POLYMER TO PROCESSED DIFFUSION TRANSFER LIGHT SENSITIVE ELEMENT

Monis J. Manning, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 17, 1973, Ser. No. 424,923

Int. Cl.² G03C *5/54*, *5/26*

U.S. Cl. 96—29 R 8 Claims

1. In a process for forming a diffusion transfer negative element capable of being employed to provide reflection images which comprises:
   a. exposing a diffusion transfer photosensitive element comprising a silver halide layer to actinic radiation;
   b. providing a layer of processing composition including a developing agent whose adherence to said negative element after the development and fixing of said negative element would adversely affect the quality of the negative image, a silver halide solvent, and a film-forming polymer between said exposed diffusion transfer photosensitive element and a diffusion transfer silver receptive stratum in face-to-face relationship therewith;
   c. developing said exposed diffusion transfer photosensitive element to provide a negative image and forming a positive image thereof in said silver receptive stratum by silver diffusion transfer as a function of point-to-point degree of exposure of said photosensitive element;
   d. separating said silver receptive stratum from said negative image which has said layer of processing composition adhered thereto;
   e. washing said developed negative image with aqueous sodium sulfite, and
   f. washing said negative with water, the improvement which comprises applying to the surface of said layer of processing composition while said surface remains moist and before washing with aqueous sodium sulfite a uniform layer of a vapor-permeable polymeric macromolecule whereby washing of said negative image may be delayed for an extended period without injury to it.

3,941,598

COMPLEXING RESIDUAL PHOTOSENSITIVE POLYHALOGEN COMPOUND WITH THE TERTIARY AMINE

Hugo Vital Van Goethem, Edegem; Edwin Hendrik Hazenbosch, Mechelen, and Albert Lucien Poot, Kontich, all of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed July 6, 1973, Ser. No. 376,965

Claims priority, application United Kingdom, July 10, 1972, 32149/72

Int. Cl.² G03C *5/24*, *1/48*

U.S. Cl. 96—48 R 19 Claims

1. In a recording process comprising the step of image-wise exposing to an activating radiation image a recording layer containing:
   a. a polyhalogen hydrocarbon compound releasing free radicals by photolytically decomposition when exposed to activating radiation, and
   b. A dye precursor compound reactive upon contact with said free radicals released in the exposed areas of said layer to produce a colored dye image,

   the improvement of stabilizing the unexposed regions of said layer by the steps of:

   removing residual undecomposed polyhalogen compound from said layer and contacting the removed polyhalogen compound with a cycloaliphatic tertiary amine reactive with said polyhalogen compound to form a solid non-light-sensitive complex.

15. A recording material comprising a recording layer containing:
   a. a polyhalogen hydrocarbon compound releasing free radicals by photolytically decomposition when exposed to activating radiation, and
   b. a dye precursor compound reactive upon contact with said free radicals released in the exposed areas of said layer to produce a colored dye image,

   in sandwich relation with said recording layer a stabilizing layer containing a cycloaliphatic tertiary amine reactive with said polyhalogen compound to form a solid non-lightsensitive complex, whereby residual polyhalogen compound in said layer after exposure thereof to said activating radiation is transferable to said stabilizing layer by heating to volatilize said residual compound.

3,941,599

METHOD FOR OBTAINING A COLOR CONTRAST PHOTOGRAPHIC IMAGE, PHOTOGRAPHIC ELEMENT AND DEVELOPMENT COMPOSITION SUITABLE FOR THE REALIZATION OF SAID METHOD

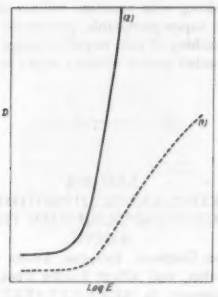
Vinicio Busatto, Savona, and Luigi Franchi, Ferrania, Savona, both of Italy, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 413,966, Nov. 8, 1973. This application June 20, 1975, Ser. No. 588,899

Claims priority, application Italy, Nov. 15, 1972, 54051/72

Int. Cl.² G03C 5/30, 7/16

U.S. Cl. 96—66.3 7 Claims



1. Development compositions containg from 1 to 15 grams of a p-phenylendiamine compound as color developing agent which includes from 0.01 to 1 grams of phenidone and from 3×10^{-4} to 6×10^{-3} moles of alkali or ammonium thiosulfate.

3,941,600

METHOD OF FORMING A PHOTOGRAPHIC EMULSION LAYER

Vivian K. Walworth, Concord, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed July 27, 1973, Ser. No. 383,262

Int. Cl.² G03C 1/84, 1/02

U.S. Cl. 96—80 17 Claims

16. A process for forming a multicolor photosensitive element which comprises depositing on a substrate a multiplicity of elemental portions wherein each of said elemental portions comprises dye image-forming material and sensitizing dye disposed in a colloid binder material wherein said elemental portions are made up of at least two sets of elemental portions sensitive to light of different wavelengths, which elemental portions form a pattern which simulates a color screen type of pattern; gelling said binder material and imbibing into said gelled elemental portions an aqueous solution of a water-soluble complex of silver halide complexed with excess halide and crystallizing photosensitive silver halide crystals by decomplexation of said halide complex within said gelled layer.

3,941,601

PHOTOGRAPHIC SILVER HALIDE MATERIAL WHICH CONTAINS COLOR COUPLERS

Willibald Pelz, Cologne; Hans-Heinrich Credner, Hohenschaeftlarn; Walter Schulte, Opladen; Alfons Klein, Duesseldorf; Karlfried Wedemeyer, and Fritz Nittel, both of Cologne, all of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

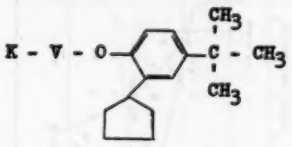
Continuation-in-part of Ser. No. 342,887, March 19, 1973, abandoned. This application Dec. 9, 1974, Ser. No. 530,719

Claims priority, application Germany, Mar. 23, 1972, 2214060

Int. Cl.² G03C 1/40

U.S. Cl. 96—100 2 Claims

1. A color photographic gelatin silver halide emulsion having improved stability against crystallization characterized in that it contains in an organic solvent an effective amount of a color coupler of the following formula:



in which

K represents a radical with color coupling properties selected from the group consisting of α-naphthol, pyrazolene-5 or open-chain ketomethylene groups;

V represents a connecting link which links the 2-cyclopentyl-4-t.-butyl-phenoxy group with the coupler radical, selected from the group consisting of a $-NH-(CH_2)_n$ and a

and a $-CO-O-(CH_2)_2$ group;

R_1 represents hydrogen or an alkyl radical preferably with up to 12 carbon atoms; and

n equals an integer, preferably 2, 3 or 4.

3,941,602

FOGGED, DIRECT-POSITIVE SILVER HALIDE EMULSION OPTICALLY SENSITIZED WITH A DYE CONTAINING A PYRROLO[2,1-B]THIAZOLE NUCLEUS

Henri Depoorter, Mortsel, and Felix Jan Moelants, Wilrijk, both of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Apr. 24, 1974, Ser. No. 463,804

Claims priority, application United Kingdom, Apr. 25, 1973, 19616/73

Int. Cl.² G03C 1/02, 1/36

U.S. Cl. 96—101 8 Claims

1. A direct-positive photographic element comprising a support and a spectrally-sensitized light-sensitive silver halide emulsion layer containing fogged silver halide grains wherein the said emulsion is spectrally sensitized by means of a dye containing a pyrrolo[2,1-b]thiazole nucleus, the said nucleus being linked by the 5- or 7-carbon atom thereof, directly or through a dimethine chain to another 5- or 6- membered nitrogen containing heterocycle.

3,941,603

TiO_2 PIGMENT FOR INDUSTRIAL PAINTS BASED ON WATER REDUCIBLE SYSTEMS

Paul Gordon Schmidt, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed Feb. 1, 1974, Ser. No. 438,942
Int. Cl.² C09C 1/36
U.S. Cl. 106—300 3 Claims

1. A new pigment composition exhibiting a high level of hiding power, gloss and dispersibility comprising: rutile TiO_2 coated successively and separately with a precipitate of titania and a precipitate of alumina, the weight ratio of titania:alumina being about 0.5:1 to 1:1 and the total percentage of titania and alumina being about 7 to 8%, based on the weight of said rutile TiO_2.

3,941,604

FAST-FIRING CERAMIC COMPOSITION AND CERAMIC ARTICLE MADE THEREFROM

Walter A. Boyce, Glen Ridge, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 22, 1971, Ser. No. 126,485
Int. Cl.² C09D 11/12; C04B 33/26, 35/14; E05C 7/06
U.S. Cl. 106—39.5 11 Claims

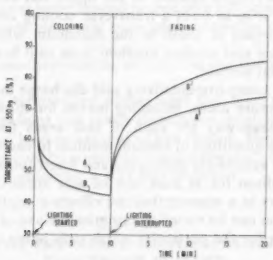
1. A composition which forms a dense ceramic article when compressed and subsequently fired in air at a temperature of about 1,000°C. for 10 minutes to 1 hour, said composition consisting essentially of: (a) from about 25% to 45% by weight of clay, (b) from about 25% to 45% by weight of powdered glass that has a softening point below about 800°C., and (c) from about 10% to 25% by weight of a mineral selected from the group consisting of wollastonite, talc, petalite, potter's flint, and mixtures thereof.

3,941,605

REVERSIBLE LIGHT-SENSITIVE GLASS

Toshiharu Yamashita, Hachioji, Japan, assignor to Hoya Glass Works, Ltd. and Hoya Lens Co., Ltd., both of Tokyo, Japan

Filed July 31, 1974, Ser. No. 493,435
Claims priority, application Japan, Mar. 9, 1974, 49-27444
Int. Cl.² C03C 3/00
U.S. Cl. 106—47 Q 2 Claims



1. A reversible light-sensitive glass comprising 100 parts of a base glass composition consisting, in weight percent, of 48 to 62% SiO_2, 15 to 22% B_2O_3, 0 to 11% Al_2O_3, 0 to 10% ZrO_2, $6<Al_2O_3+ZrO_2<13\%$, 6 to 16% R_2O where R represents Li, Na or K, 0.5 to 7% BaO, a BaO/R_2O ratio of 0.035 to 0.65, 0 to 2% TiO_2, 0 to 2.5% Nd_2O_3, 0 to 2.5% Ho_2O_3, 0 to 2.5% Er_2O_3, $0.2<Nd_2O_3+Ho_2O_3+Er_2O_3<2.5\%$ and 0.002 to 0.03% CuO, and as light-sensitive components 0.15 to 1.0 part of Ag and more than the Ag chemical equivalent of halogens selected from the group consisting of Cl, Br and I.

3,941,606

METAL CARBOXYLATE-ALKOXY ALCOHOLATE COMPOSITION AND PROCESS

Albert V. Collins, Fairview Park, and Richard E. Pearl, Cleveland, both of Ohio, assignors to Mooney Chemicals, Inc., Cleveland, Ohio

Continuation of Ser. No. 164,426, July 20, 1971, abandoned. This application Nov. 12, 1973, Ser. No. 414,654
Int. Cl.² C09F 9/00
U.S. Cl. 106—243 18 Claims

1. A hydrocarbon-soluble composition comprising the reaction product of

a polyvalent metal in a form

selected from the group consisting of free metals, oxides, hydroxides, acetates, and carbonates or the polyvalent elements cobalt, nickel and manganese, and mixtures thereof,

with a mixture of reactants comprising

at least one acid substance selected from the group consisting of higher fatty acids containing at least five carbon atoms, alkoxy and phenoxy fatty acids, ether and thioether monocarboxylic acids, tall oil fatty acids and naphthenic acids, and

at least one other substance, selected from the group consisting of members within the formula

$$[R_n(OR')_zOH]_y$$

wherein

R is a hydrogen or an alkyl radical containing 1 to 10 carbon atoms;

n is 0 or 1;

R' is an alkylene radical which contains from 2 to 4 carbon atoms and may have substituent hydroxyl groups;

y has a value of from 0 to 4;

z has a value of 2 when n is zero, and a value of 1 when n is 1 and R is hydrogen or alkyl;

the above described reactants being induced to reaction by heating;

the ratio of the number of equivalents of the metal moiety to the acid moiety being not less than 1.0 and the equivalents ratio of the metal moiety to the said other substance being at least 0.5;

said composition having a negative acid number.

3,941,607

METHOD FOR PRODUCTION OF A SURFACE LAYER FOR TRAFFIC AREAS AND THE LIKE

Albert Schuhbauer, Hochstadt, Post Wessling, and Otto Hieber, Dillingen, both of Germany, assignors to Alfred Kunz & Co., Munich, Germany

Filed Oct. 31, 1973, Ser. No. 411,204
Claims priority, application Germany, Oct. 31, 1972, 2253495
Int. Cl.² C08L 95/00
U.S. Cl. 106—281 R 11 Claims

1. A method for the production of a surface layer for traffic areas and the like comprising the steps of:

selecting chip grains from a group of chips having mean diameters in the range of 2 – 25 mm and a mean size ratio of not more than 1:3 between the smallest and the biggest grains;

adding a bituminous binder comprising a stiffening agent to said chip grains;

compacting said chip grain-binder combination;

adding a high viscosity flowable mortar to said compacted combination; and

inducing said mortar to penetrate the combination to substantially the entire depth thereof.

3,941,608

FLOW AGENT FOR INK SYSTEMS

Gerry H. Ehrhardt, West Des Moines, and Ronald L. Reeves, Des Moines, both of Iowa, assignors to Frye Copysystems, Inc., New York, N.Y.

Filed May 23, 1973, Ser. No. 363,083
Int. Cl.² B01F *17/00*; C09D *3/00*, *11/10*
U.S. Cl. 106—285 6 Claims

1. A method forming an improved dispersant/flow agent for mixtures of finely divided solid materials in liquifiable vehicles comprising the steps of

oxidizing a linear unsaturated alpha olefinic hydrocarbon having at least 20 carbon atoms in the linear chain thereof, a melting point of about 70°F. to 200°F. and a terminal carbon to carbon double bond at a temperature of at least 300°F. to an acid number of no greater than about 8 and a saponification number of no greater than about 25,

reacting said oxidized hydrocarbon with an amine selected from the group consisting of ammonia, monoethanolamine and mono substituted amine homologs thereof at a temperature less than about 270°F. to produce a modified oxidized hydrocarbon containing less than 0.19% nitrogen by weight thereof,

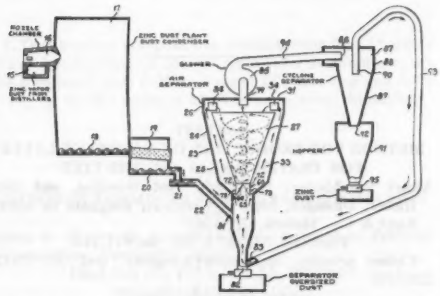
and reacting said modified oxidized hydrocarbon with about 3 to about 9% of an organic isocyanate selected from the group consisting of 2,4 tolylene diisocyanate, 2,6 tolylene diisocyanate, polymethylene polyphenyl isocyanate and pp′ diphenyl methane diisocyanate at a temperature below about 220°F.

3,941,609

ZINC DUST, ITS PREPARATION, AND APPARATUS FOR PREPARING SAME

Melvin Stern, Levittown, Pa., assignor to ASARCO Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 172,806, Aug. 18, 1971, abandoned. This application Aug. 22, 1973, Ser. No. 390,479
Int. Cl. C09c *1/04*; C08h *17/04*
U.S. Cl. 106—290 7 Claims



1. In a protective coating composition comprising zinc dust and an organic binder, the improvement which comprises utilizing as the zinc dust in said composition, by weight, about 50 to about 95% of a zinc dust comprising generally spherical zinc dust grains and having a grain size distribution as determined by a Coulter Counter such that at least about 98% of the grains have a grain size less than 15 microns, about 85 to about 93% of the grains have a grain size less than 10 microns, about 45 to about 55% of the grains have a grain size less than 5 microns, and no more than about 3% of the grains have a grain size less than 2 microns, said dust having a metallic zinc content of about 95–98%.

3,941,610

MAGNESIUM HYDROXIDE-CONTAINING PAPER

John Maskal; Ivan M. Thompson, both of Ludington, and Henrik R. Heikel, Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 773,350, Nov. 4, 1968, Pat. No. 3,639,158. This application May 17, 1971, Ser. No. 144,247
Int. Cl.² C09C *3/00*
U.S. Cl. 106—308 M 6 Claims

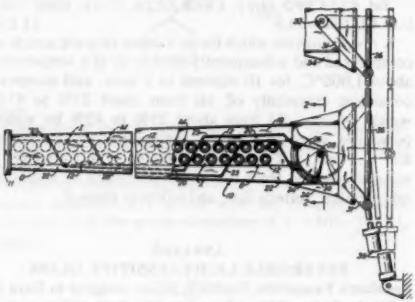
4. A pigment composition for use as a paper coating which comprises a magnesium hydroxide pigment having from about 1 to about 5 weight percent calcium ion concentration in solid solution and having from about 10 to about 25 weight percent of at least one binder material.

3,941,611

APPARATUS FOR COOLING STRIP LIKE MATERIAL

Joseph Irwin Greenberger, Pittsburgh, Pa., assignor to Wean United, Inc., Pittsburgh, Pa.

Filed Nov. 4, 1974, Ser. No. 520,812
Int. Cl.² B08B *3/02*
U.S. Cl. 134—64 R 5 Claims



1. An apparatus for cooling varying width relatively flat strip produced by a hot strip mill, comprising:

header means mounted over a passing strip and receiving coolant medium,

a number of discharge members carried by said header means arranged relative to the upper flat surface of the passing strip to form a transverse cooling zone approximately equal in width to the maximum width strip for delivering said coolant medium from said header to said upper flat surface,

means for compartmentalizing said discharge members into two or more areas, including means for forming a separate passageway for each of said areas for delivering separate quantities of coolant medium to each area, and

means for selectively delivering and interrupting said coolant medium for at least one of said areas of discharge members in a manner that the effective cooling width of said zone can be varied to optimize the use of the coolant medium for the particular width strip being cooled.

3,941,612

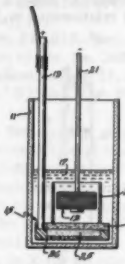
CATHODE COMPOSITION FOR ELECTROCHEMICAL CELL

Robert K. Steunenberg, Naperville; Allan E. Martin, Woodridge, and Zygmunt Tomczuk, Palos Hills, all of Ill., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Mar. 4, 1975, Ser. No. 555,317
Int. Cl.² H01M *35/02*
U.S. Cl. 136—6 LF 7 Claims

1. In a secondary, high-temperature electrochemical cell including an alkali metal reactant in the anode, a cathode

reactant composition including a chalcogen compound in the cathode and an electrolyte containing ions of said alkali metal,



the improvement wherein said cathode reactant composition comprises a mixture of a major proportion by weight FeS and a minor proportion by weight Cu_2S.

3,941,613

HAIR FROSTING DEVICE

Robert E. Nicoletti, 3043 Wing St., San Diego, Calif. 92110

Filed Apr. 1, 1974, Ser. No. 456,542

Int. Cl.² A45D 1/00

U.S. Cl. 132—9 1 Claim

1. A hair frosting device comprising:

an elongated container forming an enclosure for containing one or more strands of hair therein;

said container being hinged on one side and snap-latched on an opposite side, said snap latch consisting of a sealable seam;

said container terminating on one end in a flat face portion; and

said seam terminating across said flat face portion and having at least one notch therein for receiving and positioning at least one strand of hair therein, said at least one notch formed by completely complimentary edges operable for maintaining a seal therebetween.

3,941,614

METHOD OF PREPARING HIGH CAPACITY NICKEL ELECTRODE POWDER

John F. Jackovitz, Monroeville, and Earl A. Pantier, Verona, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 13, 1975, Ser. No. 558,110

Int. Cl.² H01M 4/16

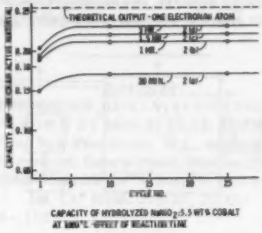
U.S. Cl. 136—29 15 Claims

1. A method of producing a battery electrode plate containing active battery material, comprising the steps of:

a. mixing NiO with Na_2O_2 in a weight ratio of $NiO:Na_2O_2$ of between about 1:1.35 to about 1:2.1;

b. heating the mixture of NiO and Na_2O_2 between about 800°C – 1150°C, for about ½ hour to 8 hours, to melt the mixture and to form $NaNiO_2$;

c. hydrolyzing the $NaNiO_2$ in water at between about 20°C–95°C to form active battery material and then washing the active battery material;



CAPACITY OF HYDROLYZED $NaNiO_2$ 5.5 WT% COBALT AT 1000°F. -EFFECT OF REACTION TIME

d. maintaining the activity of the battery material by maintaining the temperature of the material below about 65°C; and

e. applying the battery material to a porous metallic plaque.

3,941,615

BATTERY CONSTRUCTION

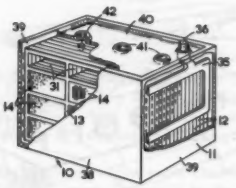
William Leslie McDowall, North Clayton, Australia, assignor to Dunlop Australia Limited, Melbourne, Australia

Filed Sept. 20, 1973, Ser. No. 399,778

Claims priority, application Australia, Sept. 25, 1972, 569/72

Int. Cl.² H01M 4/80

U.S. Cl. 136—38 9 Claims



1. A multi-cell battery including a plurality of frames formed of a moldable material which is electrically insulating at the intended operating voltage of the battery and is inert to the active materials of the battery and any material produced during operation of the battery, each frame defining a plurality of separate material support areas arranged in side-by-side relationship across the width of the frame, each frame including portions forming divisions between adjacent support areas of the frame, the frames being arranged in a side-by-side relationship in a direction normal to the width of the frame with the portions of each frame forming the divisions between adjacent support areas secured in a sealed relationship to the corresponding portions in adjacent frames to form partitions between adjacent cells of the battery.

3,941,616

SEA WATER BATTERY

Esko Ensio Huhta-Kowisto, Haukilahti, Finland, assignor to Puolustusministerio, Helsinki, Finland

Continuation-in-part of Ser. No. 309,132, Nov. 24, 1972, abandoned. This application Oct. 2, 1974, Ser. No. 511,195

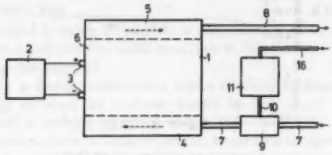
Claims priority, application Finland, Nov. 25, 1971, 3380/71

Int. Cl.² H01M 6/00

U.S. Cl. 136—100 M 5 Claims

1. A discardable sea water battery especially adapted for torpedoes, comprising a battery cell system having electrode plates of magnesium and silver chloride, an input duct con-

nected with said battery cell system, an inlet pipe connected with said input duct, an ejector carried by said inlet pipe, a discharge duct connected with said battery cell system, a discharge pipe connected with said discharge duct, a tank adapted to contain a solution, and means connecting said tank with said ejector and with sea water for supplying sea water to



said ejector while mixing it with the solution from said tank, said sea water mixture flowing through said input duct into the battery cell system where it serves an electrolyte and leaving the battery cell system through said discharge pipe, said solution containing chemicals impoving the efficiency of the electrolyte.

3,941,617

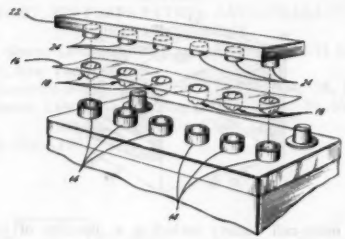
BATTERY PACKAGE AND METHOD

John M. Nees, Wyomissing, Pa., assignor to General Battery Corporation, Reading, Pa.

Filed May 15, 1975, Ser. No. 577,911

Int. Cl.² H01M 2/12

U.S. Cl. 136—170 **2 Claims**



1. A charged and dumped battery package, comprising: a charged and dumped battery casing with residual electrolyte therein and having vent ports therein; battery sealing strip means comprising a thin sheet of plastic material having a plurality of indentations therein forming protrusions extending from one side thereof, each of said protrusions having a minute vent hole therein, said protrusions engaging the vent ports of said battery casing in interference fit therewith; a plurality of standard vents having protrusions engaging the indentations in said strip; and a retaining means engaging said standard vents and said battery casing to retain said standard vents in engagement with said indentations.

3,941,618

BATTERY CASSETTE AND APPARATUS THEREOF

Kenichi Mabuchi, 3-34, Mita 2-chome, Minato, Tokyo, Japan

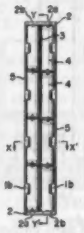
Filed Nov. 19, 1973, Ser. No. 417,076

Claims priority, application Japan, Nov. 24, 1972, 47-118337

Int. Cl.² H01M 2/10

U.S. Cl. 136—173 **5 Claims**

1. A non-metallic cassette for batteries having positive and negative electrodes, said cassette comprising at least one plastic base plate member, front and rear plastic plate members and a plastic partition plate member defining, in combination, at least two side-by-side battery housing sections, all of said plate members being formed as a unitary structure, a plurality of resilient, plastic lugs formed integrally with said base plate member for releasably holding a plurality of batteries in axial, end-to-end relationship in the battery housing



sections, and two openings formed in each said front and rear plate member for enabling the connection of the electrodes of the batteries directly adjacent thereto to means for either utilizing or charging the batteries while the batteries are contained in said cassette.

3,941,619

PROCESS FOR IMPROVING THE ELONGATION OF GRAIN REFINED COPPER BASE ALLOYS CONTAINING ZINC AND ALUMINUM

Eugene Shapiro, Hamden, and Jacob Crane, Woodbridge, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed May 12, 1975, Ser. No. 576,690

Int. Cl.² C22D 1/08

U.S. Cl. 148—11.5 R **15 Claims**

1. A process for improving the elongation of copper base alloys by controlled grain coarsening comprising:

providing a copper base alloy containing about 2 to 4.5% aluminum, 15 to 31% zinc, and a grain refining element selected from the group consisting of iron about 0.001 to 3%, chromium about 0.001 to 1%, zirconium about 0.001 to 1.0%, cobalt about 0.001 to 3.0%, and mixtures of these elements, and balance essentially copper, said alloy being in the annealed condition;

subjecting said alloy to a cold reduction of about 15 to 40%;

then annealing said alloy at a temperature of about 625° to 725°C.;

subjecting said alloy to a final cold reduction of 12 to 45%; and

then final annealing said alloy at a temperature of about 600° to about 725°C.

3,941,620

METHOD OF PROCESSING COPPER BASE ALLOYS

Michael J. Pryor; Jacob Crane, both of Woodbridge; Sam Friedman, and Eugene Shapiro, both of Hamden, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 487,470, July 11, 1974. This application Dec. 18, 1974, Ser. No. 534,015

Int. Cl.² C22F 1/08

U.S. Cl. 148—12.7 **11 Claims**

1. A method for processing copper base alloys to provide good strength and bend characteristics which comprises:

A. providing a completely recrystallized, wrought copper base alloy consisting essentially of 7 to 14% nickel, 1.5 to 3.3% tin and the balance copper;

B. cold rolling with a reduction of 20 to 50%;

C. aging at a temperature of from 300° to 550°C for 15 minutes to 24 hours; and

D. cold rolling with a reduction of from 20 to 55%, wherein the total reduction of said recrystallized alloy is less than about 65%.

3,941,621

COATINGS FOR FERROUS SUBSTRATES

Leonard S. Lee, Daly City; Samuel W. Sopp, Foster City, and Howard M. Siegel, Pacifica, all of Calif., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 521,015, Nov. 15, 1974, which is a continuation-in-part of Ser. No. 360,257, May 14, 1973, abandoned. This application Apr. 21, 1975, Ser. No. 570,053

Int. Cl.² B23K *35/24;* H01F *1/04*

U.S. Cl. 148—27 2 Claims

1. A composition for coating magnetic ferrous material prior to the step of annealing said material comprising MgO, $Mg(OH)_2$ or mixtures thereof, at least one lithium compound and at least one magnesia-silica complex containing from about 0.001 to 2.0% by weight of an alkali metal oxide or hydroxide wherein the mole ratio of the $MgO:SiO_2$ is from about 1:25 to 14:1, said magnesia-silica complex being amorphous as indicated by its X-ray powder diffraction pattern and exhibiting the following differential thermal behavior characteristics: an endothermic peak at about 250°C., an exothermic peak at about 820° and at about 980°C.

3,941,622

COATINGS FOR FERROUS SUBSTRATES

Leonard S. Lee, Daly City; Yoshio Uyeda, San Mateo, and Samuel W. Sopp, Foster City, all of Calif., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 512,562, Oct. 7, 1974, which is a continuation-in-part of Ser. No. 486,790, July 9, 1974, abandoned, which is a continuation of Ser. No. 267,276, June 29, 1972, abandoned, which is a continuation-in-part of Ser. No. 195,010, Nov. 2, 1971, abandoned. This application Apr. 21, 1975, Ser. No. 570,291

Int. Cl.² B23K *35/24;* C04B *35/04*

U.S. Cl. 148—27 6 Claims

1. A composition useful in the coating of magnetic ferrous material prior to the step of annealing said coated material comprising MgO, $Mg(OH)_2$ or mixtures thereof and at least one magnesia-silica complex wherein the mole ratio of the $MgO:SiO_2$ is from about 1:25 to 14:1, said complex containing from about 0.001 to 2.0% by weight of an alkali metal oxide, said magnesia-silica complex being amorphous as indicated by its X-ray powder diffraction pattern and exhibiting the following differential thermal behavior characteristics: an endothermic peak at about 250°C.; an exothermic peak at about 820° and at 980°C.

4. A magnesia-silica complex containing from about 0.001 to 2.0% by weight of an alkali metal oxide wherein the mole ratio of $MgO:SiO_2$ is from about 1:25 to 14:1, said magnesia-silica complex being amorphous as indicated by its X-ray powder diffraction pattern and exhibiting the following differential thermal behavior characteristics: an endothermic peak at about 250°C., an exothermic peak at about 820°C. and 980°C.

3,941,623

METHOD FOR PRODUCING A GRAIN-ORIENTED ELECTRICAL STEEL SHEET USING SEPARATORS COMPRISING METAL NITRIDES

Kikuo Takashina; Minoru Kitayama; Motoharu Nakamura; Yozo Suga, and Kiyoshi Tanaka, all of Himeji, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Aug. 23, 1974, Ser. No. 500,079

Claims priority, application Japan, Aug. 28, 1973, 48-96392

Int. Cl.² H01F *1/04*

U.S. Cl. 148—113 2 Claims

1. In a method for producing a grain-oriented electrical steel sheet having highly stabilized magnetic and film properties of the type comprising cold rolling hot rolled steel sheet containing not more than 4.5% Si into a final thickness, annealing the cold rolled sheet, applying an annealing separator to the steel sheet and subjecting the thus coated steel sheet to high-temperature annealing, the improvement which comprises said annealing separator containing one or more of metal nitrides selected from the group consisting of chromium nitride, titanium nitride, vanadium nitride, and combinations thereof in an amount not less than 0.5 part by weight to 100 parts of the annealing separator, and carrying out said annealing at a temperature not lower than 1,100°C.

3,941,624

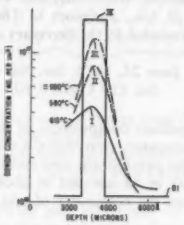
SN-DOPED GROUP III(A)-V(A) GA-CONTAINING LAYERS GROWN BY MOLECULAR BEAM EPITAXY

Alfred Yi Cho, New Providence, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 28, 1975, Ser. No. 563,078

Int. Cl.² H01L *21/203, 21/363*

U.S. Cl. 148—175 5 Claims



1. A molecular beam epitaxy technique for fabricating layers of Ga-containing Group III(*a*)-V(*a*) compounds with abrupt doping profiles which follow relatively closely the time-intensity profile of a dopant beam, comprising the steps of:

a. placing a substrate in an evacuable chamber;

b. reducing the background pressure in the chamber to a subatmospheric pressure;

c. preheating said substrate to a temperature in the range of about 450° to 650°C,

d. directing at least one molecular beam containing Ga and the other constituents of said compound at said substrate for a time period effective to grow said layer to a desired thickness;

e. during step (d) directing another molecular beam containing a dopant at said substrate to produce a predetermined doping profile in said layer; characterized in that:

1. said dopant is Sn;

2. said substrate temperature is maintained in the range of about 450° and 550°C so that surface segregation effects of Sn atoms/molecules are alleviated and said doping profile substantially follows the time-intensity profile of said another beam of step (e).

3,941,625

GLASS PASSIVATED GOLD DIFFUSED SCR PELLET AND METHOD FOR MAKING

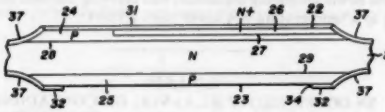
Richard W. Kennedy, Skaneateles, and Edward G. Tefft, Auburn, both of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed Oct. 11, 1973, Ser. No. 405,489

Int. Cl.² H01L *21/225*

U.S. Cl. 148—187 8 Claims

6. A method according to claim 5 wherein said step of thermally growing a layer of oxide is carried out at a tempera-

ture above approximately 1,100° C, said step of diffusing said impurity is carried out at a temperature of approximately 800°

to 900° C and said step of applying heat to fuse said glass is carried out at a temperature of approximately 700° C.

3,941,626

ENERGETIC LIQUID MONOPROPELLANT COMPOSITIONS CONTAINING HYDRAZINE AND METHOXYLAMINE PERCHLORATE

John F. Phillips, Florence; James A. Murfree, Jr., Huntsville; Walter W. Wharton, Huntsville, and William A. Duncan, Huntsville, all of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 24, 1970, Ser. No. 48,781
Int. Cl.² C06D 5/10
U.S. Cl. 149—36 2 Claims

1. A monopropellant composition of matter, for use in a liquid type gas generator, comprising a solution of hydrazine and methoxylamine perchlorate, said methoxylamine perchlorate being present in an amount of about 15 to about 25 weight percent and the remainder of said solution being hydrazine.

3,941,627

METHOD OF PRODUCING TARNISH RESISTANT COPPER AND COPPER ALLOYS AND PRODUCTS THEREOF

Elmer J. Caule, New Haven, Conn., assignor to Olin Corporation, New Haven, Conn.

Division of Ser. No. 177,292, Sept. 2, 1971, Pat. No. 3,764,400, which is a continuation-in-part of Ser. Nos. 59,684, July 30, 1970, Pat. No. 3,677,828, and Ser. No. 67,943, Aug. 28, 1970, Pat. No. 3,716,427, which is a continuation-in-part of Ser. No. 59,684. This application Mar. 26, 1973, Ser. No. 344,843
Int. Cl.² H05K 3/06
U.S. Cl. 156—3 12 Claims

1. A method of producing a flexible printed circuit comprising:
A. providing a material selected from the group consisting of copper foil and copper sheet,
B. applying to a surface of said material a phosphoric acid solution of at least 8% concentration and containing from 3.5 grams per liter up to the solubility limit of a material selected from the group consisting of sodium dichromate and potassium dichromate and mixtures thereof, for at least 2 seconds, to form a uniform, glassy-like, substantially porefree coating of copper phosphate from 20 to 1,000 Angstroms thick, provided that when the concentration of phosphoric acid is increased, the minimum dichromate concentration is proportionately increased.
C. rinsing said material for at least two seconds in water at a pH of at least 8.0 and at a temperature from about 90°C up to the boiling point,
D. drying said material,
E. adhesively laminating a plastic film to said surface,
F. applying a photoresist to the opposing surface of said material,
G. projecting a circuitry pattern upon said photoresist wherein said photoresist is transformed into an acid insoluble compound at said circuitry pattern,
H. dissolving away the unwanted portion of said material from said circuitry pattern by an acid solution,
I. rinsing said surface, and
J. drying said surface, thereby forming a flexible printed circuit.

7. A method of producing a flexible printed circuit comprising:
A. providing a material selected from the group consisting of copper foil and copper sheet,
B. oxidizing a surface of said material to form a surface oxide film from 150 to 1,000 Angstrom units in thickness,
C. applying a phosphoric acid solution of at least 8% concentration to said oxide film to form thereon a uniform, glassy-like, substantially porefree coating of copper phosphate,
D. rinsing said material for at least two seconds in water at a pH of at least 8.0 and at a temperature from about 90°C up to the boiling point,
E. drying said material,
F. adhesively laminating a plastic film to said surface,
G. applying a photoresist to the opposing surface of said material,
H. projecting a circuitry pattern upon said photoresist wherein said photoresist is transformed into an acid insoluble compound at said circuitry pattern,
I. dissolving away the unwanted portion of said material from said circuitry pattern by an acid solution,
J. rinsing said surface, and
K. drying said surface, thereby forming a flexible printed circuit.

3,941,628

METHOD OF PRODUCING TARNISH RESISTANT COPPER AND COPPER ALLOYS AND PRODUCTS THEREOF

Elmer J. Caule, New Haven, Conn., assignor to Olin Corporation, New Haven, Conn.

Division of Ser. No. 177,291, Sept. 2, 1971, Pat. No. 3,764,399, which is a continuation-in-part of Ser. Nos. 59,684, July 30, 1970, Pat. No. 3,677,828, and Ser. No. 67,943, Aug. 28, 1970, Pat. No. 3,716,427, which is a continuation-in-part of Ser. No. 59,684. This application Mar. 15, 1973, Ser. No. 341,404
Int. Cl.² H05K 3/06; G03C 5/00
U.S. Cl. 156—3 12 Claims

1. A method of producing a flexible printed circuit comprising:
A. providing a material selected from the group consisting of copper foil and copper sheet,
B. applying to a surface of said material a phosphoric acid solution of at least 8% concentration and containing from 3.5 grams per liter up to the solubility limit of a material selected from the group consisting of sodium dichromate and potassium dichromate and mixtures thereof, for at least 2 seconds, to form a uniform, glassy-like, substantially porefree coating of copper phosphate from 20 to 1,000 Angstroms thick, provided that when the concentration of phosphoric acid is increased, the minimum dichromate concentration is proportionately increased,
C. rinsing said material for at least two seconds in water at a pH of from about 4.9 to 6.3 and at a temperature from about 90°C up to the boiling point,
D. drying said material,
E. adhesively laminating a plastic film to said surface,
F. applying a photoresist to the opposing surface of said material,
G. projecting a circuitry pattern upon said photoresist wherein said photoresist is transformed into an acid insoluble compound at said circuitry pattern,
H. dissolving away the unwanted portion of said material from said circuitry pattern by an acid solution,

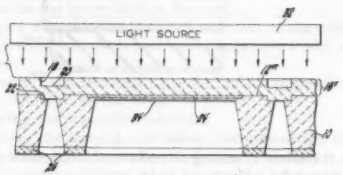
I. rinsing said surface, and
J. drying said surface, thereby forming a flexible printed circuit.

7. A method of producing a flexible printed circuit comprising:
A. providing a material selected from the group consisting of copper foil and copper sheet,
B. oxidizing a surface of said material to form a surface oxide film from 150 to 1,000 Angstrom units in thickness,
C. applying a phosphoric acid solution to said oxide film to form thereon a uniform, glassy-like, substantially pore-free coating of copper phosphate,
D. rinsing said material for at least two seconds in water at a pH of from about 4.9 to 6.3 and at a temperature from about 90°C up to the boiling point,
E. drying said material,
F. adhesively laminating a plastic film to said surface,
G. applying a photoresist to the opposing surface of said material,
H. projecting a circuitry pattern upon said photoresist wherein said photoresist is transformed into an acid insoluble compound at said circuitry pattern,
I. dissolving away the unwanted portion of said material from said circuitry pattern by an acid solution,
J. rinsing said surface, and
K. drying said surface, thereby forming a flexible printed circuit.

3,941,629
DIAPHRAGM FORMATION ON SILICON SUBSTRATE

James M. Jaffe, Southfield, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 11, 1974, Ser. No. 460,106
Int. Cl.² C23F *1/02*
U.S. Cl. 156—8 2 Claims

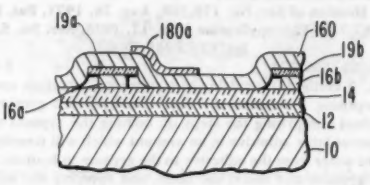


1. A method of making semiconductor pressure transducers having thin and accurately reproducible diaphragms, said method comprising:
1. oxidizing a silicon wafer for a first time period to form an oxide growth on the front side of the wafer;
2. selectively removing the oxide growth in at least one selected annular region defining the outer periphery of each pressure transducer to be formed from the wafer;
3. reoxidizing the wafer for a second time period to form an annular oxide filled groove of precisely predetermined depth in the wafer front side defined by said selected annular region, wherein said depth precisely corresponds to a desired pressure transducer diaphragm thickness;
4. forming at least one pressure responsive element on the wafer front side within an area circumscribed by said annular groove;
5. selectively masking the back side of the wafer, leaving exposed a portion of a desired diaphragm geometry aligned with said area and a spaced circumscribing annular portion aligned with said groove;
6. etching said exposed portions of the wafer from its back side to simultaneously form a recess and spaced encircling groove; and
7. stopping the etch precisely upon said encircling groove reaching the bottom of said oxide filled groove thereby providing a discrete pressure transducer with a diaphragm having a precisely determined thickness equal to that of the precisely determined oxide filled groove depth.

3,941,630
METHOD OF FABRICATING A CHARGED COUPLE RADIATION SENSING DEVICE

Robert Dean Larrabee, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 29, 1974, Ser. No. 464,971
Int. Cl.² H01L *21/306*
U.S. Cl. 156—13 9 Claims

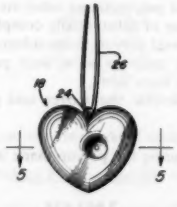


1. A method of fabricating a charge coupled radiation sensing array comprising the steps of:
forming an insulating layer on a semiconductor substrate;
covering a surface of this layer with a transparent conductor;
forming a pattern of gate electrodes on this transparent conductor layer of a metal which, when oxidized, is transparent in a region of the radiation spectrum of interest;
oxidizing substantially in its entirety the pattern of gate electrodes to convert the same to a transparent insulating pattern; and
etching away that portion of the transparent conductor layer not covered by said insulating pattern to thereby form a pattern of transparent conductors covered by transparent insulation.

3,941,631
PAPER ART PROCESS

James Robert Kirk, and Lark Warren Kirk, both of 272 Beacon St., Apt. 3, Somerville, Mass. 02143

Filed July 25, 1974, Ser. No. 491,947
Int. Cl.² B44C *3/02*
U.S. Cl. 156—59 3 Claims



1. A method of making an ornamental device comprising the steps of:
a. adhesively securing a plurality of sheets of distinguishably colored construction paper in overlying relation to form a laminate having planar top and bottom surfaces,
b. drying the laminate into a rigid, hard panel,
c. cutting the laminate along a predetermined outline in perpendicular relation to the top and bottom surfaces to form a cut-out,
d. removing material from the cut-out at predetermined areas to reveal portions of at least some of the sheets disposed inwardly of the outer sheets of the cut-out,

e. coating the cut-out with a clear waterproof material, and
f. the step of beveling and rounding the peripheral edge of the cut-out to reveal the side edge of the sheets of paper as distinguishably colored peripheral stripes visible from both the top and bottom of the object.

3,941,632

METHOD AND COMPOSITION FOR APPLYING A COVERING TO A WALL OR LIKE SUBSTRATE

Clyde J. Swedenberg, 3706 E. North St. Ext., Greenville, S.C. 29607; Charles C. Fain, Bayshore Estates, Clemson, S.C. 29631, and William W. Rutledge, 33 W. Tallulah Ave., Greenville, S.C. 29601

Division of Ser. No. 175,388, Aug. 26, 1971, Pat. No. 3,887,748. This application Mar. 17, 1975, Ser. No. 558,722
Int. Cl.² E04F 13/02
U.S. Cl. 156—71 5 Claims

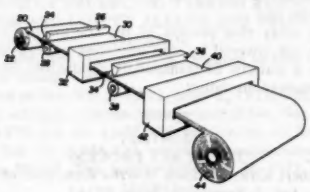
1. A method of applying to a substrate, a surface covering, comprising a substantially dry, semi-hydrated gypsum, said method comprising the steps of: coating the gypsum with an aqueous latex adhesive in an amount which will transfer sufficient water from the adhesive to the gypsum to hydrate and set the gypsum and invert the latex, and applying the adhesive-coated surface covering to the substrate.

3,941,633

PLASTIC LAMINATE, ARTICLE AND METHOD OF MAKING SAME

Tsu-Huai Wang, Hockessin, Del., and Edgar T. Key, West Chester, Pa., assignors to Seton Company, Newark, N.J.

Filed Mar. 27, 1974, Ser. No. 455,472
Int. Cl.² B32B 5/18, 31/14
U.S. Cl. 156—77 6 Claims



1. A method of making a laminate, comprising the steps of:
a. casting a layer of substantially fully reacted polyurethane as a substrate on a carrier treated with a release agent,
b. drying of said polyurethane substrate layer,
c. casting a layer of substantially completely foamed polyurethane on said polyurethane substrate,
d. heating said laminate to at least partially curing said polyurethane foam layer,
e. bonding a flexible sheet over said polyurethane foam layer,
and
f. completely curing the polyurethane layer.

3,941,634

METHOD FOR THE PREPARATION OF PAPER CONTAINING PLASTIC PARTICLES

Henrik Gustaf Folke Nisser, Falun; Jörgen Petersen, and Sten Erik Porrvik, both of Sundsvall, all of Sweden, assignors to Kemanord Aktiebolag, Stockholm, Sweden

Filed Oct. 25, 1974, Ser. No. 518,003
Claims priority, application Sweden, Oct. 26, 1973, 7314614
Int. Cl.² B32B 5/20
U.S. Cl. 156—79 8 Claims

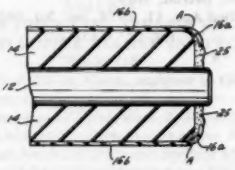
1. A method for the preparation of a composite that contains plastic particles which includes
a. forming a first partially dewatered web of cellulose fibers by depositing the fibers from a pulp on a wire support,
b. depositing on said first web a plurality of expandable plastic beads, said plastic being selected from the group consisting of copolymers of acrylonitrile and vinylidene chloride, polystyrene or copolymers thereof, or polymethylmethacrylate or copolymers thereof, in a quantity equal to between 0.05 and 60% by weight of said plastic particles based on dry cellulose fibers, said unexpanded beads having diameters within the range of 0.5 to 200 μm,
c. depositing over said beads a partially dewatered second web of cellulose fibers formed by depositing the fibers from a pulp on a wire support so that said beads are disposed between said first and second webs,
d. pressing said first and second partially dewatered webs together,
e. subjecting said pressed together webs to a temperature of at least about 75°C so as to effect both a drying of said webs and an expansion of at least a portion of said expandable beads.

3,941,635

METHOD OF SEALING THE END OF A SLEEVED ROLL

Charles L. Tavelle, North Charleston, S.C., and Robert F. Wittschen, Houston, Tex., assignors to Raybestos-Manhattan Inc., Trumbull, Conn.

Filed Aug. 28, 1974, Ser. No. 501,176
Int. Cl.² B29C 27/00; B32B 31/00
U.S. Cl. 156—86 19 Claims



1. A method of sealing an end of a sleeved roller comprising the steps of:
a. providing a sleeved roller comprising (i) a roller-shaped body having a peripheral outer surface and an end defining a beveled outer edge continuous and unitary with said surface, and (ii) a substantially tubular lamina coaxially disposed about said body having a heat-shrinkable end of thermoplastic material extending substantially beyond said body end;
b. applying a mass of synthetic elastomeric sealant over said body edge and between said lamina end and said body end; and
c. heat-shrinking said lamina end to compress said lamina end about said sealant and said body to imbed said lamina end in said sealant mass and to bondingly engage said sealant to said lamina end and said body end, thereby sealing said body end.

3,941,636

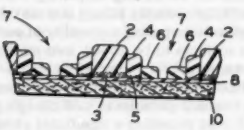
PROCESS FOR FORMING DECORATIVE SURFACE COVERINGS

Frank G. Drout, and Douglas R. Eyman, both of Lancaster, Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Continuation of Ser. No. 355,318, April 30, 1973, abandoned. This application June 28, 1974, Ser. No. 483,927
Int. Cl.² B32B 31/26, 5/28, 27/30, 31/12
U.S. Cl. 156—154 12 Claims

1. A process for producing a surface covering having a decorative multi-level wear layer comprising

1. depositing at least one layer of unfused thermoplastic granules of resinous dryblend onto a releasable substrate;
2. heating the dryblend to cause partial melting of at least surface portions of the granules at their points of contact thereby forming bonds between adjacent granules to form a cohesive, porous layer having an upper and a lower surface;
3. producing a design on said cohesive, porous layer by applying a plurality of differently colored settable resinous inks to the upper surface thereof, each colored ink being successively printed one over the other to cover a larger surface area than the area covered by a preceding printed colored ink, each of said inks being applied in amounts and viscosities sufficient to result in penetration thereof through at least 10% of the thickness of the cohesive, porous layer at the points of application in areas not penetrated by a previously applied ink, the penetration of each colored ink varying to a predetermined degree with the lateral dimensions of its area of coverage and each preceding colored ink being positioned perpendicularly



within the boundary of the area covered by the next printed color, resulting in ink-containing and non-ink-containing areas in the cohesive, porous layer in both a direction laterally across the surface of the sheet and in a direction transversely through the sheet from the upper surface to the lower surface thereof;
4. applying a backing to the upper surface of the printed, porous layer to which said settable resinous inks were applied;
5. heating to a temperature below the fusion temperature of the dryblend to set the inks;
6. removing the releasable substrate;
7. removing the non-ink-containing portions of the cohesive, porous layer from the side formerly in contact with the releasable substrate while leaving the ink-containing portions thereof substantially unaffected; and
8. heating to fuse all of the remaining resinous material in the composite structure thereby forming a decorative, multi-level, wear layer wherein each of the colored ink-containing design elements extends from the backing to varying levels with respect thereto.

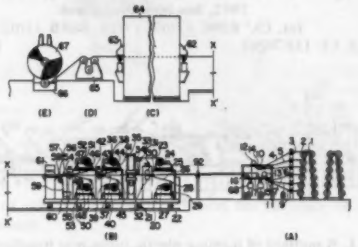
3,941,637

METHOD OF MANUFACTURING A CONVEYOR BELT AND AN APPARATUS THEREFOR

Takashi Masuda, Kobe; Shigeyuki Sozaki, Akashi; Masakatsu Ando, Minoo, and Hideo Oumi, Komaki, all of Japan, assignors to Mitsubishi Belting Limited, Kobe, Japan

Filed Nov. 9, 1972, Ser. No. 305,026
Int. Cl.² B29H *7/22*; B65H *59/18*
U.S. Cl. 156—179 **14 Claims**

1. A method of manufacturing a conveyor belt having a plurality of longitudinal steel cord tensile members comprising the steps of:
a. unwinding said tensile members from storage reels;
b. placing the tensile members in a groove around the periphery of a feeding roll including at least one magnetic roll so as to retard their movement;
c. hanging on said tensile members a piurality of pulleys, each having a weight attached thereto;
d. applying a first rubber sheet to one side of said tensile members;
e. applying a second rubber sheet to the other side of said tensile members after said first rubber sheet has been applied to said one side;
f. compressing said rubber sheets to cause them to completely surround said tensile members to form a core body;



g. applying a biased duck or breaker material to both sides of said core body;
h. applying a rubber cover sheet to both sides of the belt;
i. vulcanizing the belt; and
j. winding said vulcanized belt onto a finish storage roll.

3,941,638

MANUFACTURED RELIEF-SCULPTURED SOUND GRILLS (USED FOR COVERING THE SOUND PRODUCING SIDE AND/OR FRONT OF MOST MANUFACTURED SOUND SPEAKER ENCLOSURES) AND THE MANUFACTURING PROCESS FOR THE SAID GRILLS

Reginald Patrick Horky, 1729 Arizona, and Scott Octave Frost, 2510 Thom St., both of Flint, Mich. 48506

Filed Sept. 18, 1974, Ser. No. 506,949
Int. Cl.² B31F *1/00*
U.S. Cl. 156—196 **5 Claims**

1. A method of constructing a relief sculptured sound grill comprising:
the first step of soaking a strip of flexible material in a starch solution,
the second step of placing said strip of flexible material between a male mold member and a female mold member, said male mold member and female mold member cooperating to form a relief sculpture on said strip of flexible material,
the third step of drying said strip of flexible material,
the fourth step of applying a hardener to said relief sculpture,
the fifth step of drying said strip of flexible material,
the sixth step of removing said mold members,
the seventh step of applying a hardener to said strip of flexible material, and
the last step of drying said flexible material.

3,941,639

TUBE DOFFING AND BUNDLING METHOD

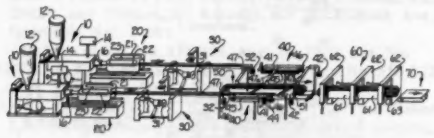
Ernest J. Maroschak, Box 878, Roseboro, N.C. 28382

Continuation-in-part of Ser. No. 285,928, Sept. 1, 1972, Pat. No. 3,870,774. This application May 29, 1973, Ser. No. 364,717

The portion of the term of this patent subsequent to Mar. 11, 1992, has been disclaimed.

Int. Cl.² B29C *17/07, 17/16;* B65B *13/02*

U.S. Cl. 156—207 12 Claims



1. A method of forming plastic tubes into bundles comprising feeding lines of successive tubes from a plurality of sources longitudinally along respective predetermined paths of travel to respective doffing stations, sensing the arrival of each successive tube in the respective doffing stations and in response thereto laterally ejecting the tubes from the respective doffing stations into a common hopper positioned adjacent the doffing stations, accumulating and stacking the tubes doffed from the doffing stations in nesting relation in the hopper, and securing pliable binding elements around the stacked and nested tubes to form a bundle thereof.

3,941,640

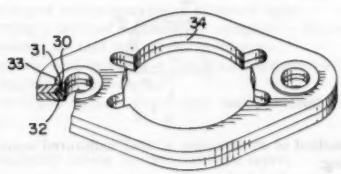
METHOD OF PRODUCING A HIGH TEMPERATURE GASKET STRUCTURE

Robert G. Farnam, New Lisbon, and Michael T. Passarella, Wisconsin Rapids, both of Wis., assignors to F. D. Farnum Co., Lyons, Ill.

Division of Ser. No. 345,356, March 27, 1973, Pat. No. 3,863,936, which is a continuation-in-part of Ser. No. 120,526, Mar. 3, 1971, Pat. No. 3,796,623, which is a division and continuation-in-part of Ser. No. 76,459, Sept. 29, 1970, Pat. No. 3,655,210, which is a continuation-in-part of Ser. No. 66,958, Aug. 26, 1970, now abandoned.

Int. Cl.² B32B *31/00*

U.S. Cl. 156—252 1 Claim



1. The method of making a high temperature gasket from semi-rigid asbestos board or the like which consists in taking two or more semi-rigid asbestos board blanks, having a plurality of bolt holes therethrough, placing one above the other with the bolt holes aligned and interposing between the two, a high temperature resistance adhesive and a metal washer at each of said bolt holes, and then compacting the laminate whereby the density of the semi-rigid asbestos board blanks is increased and the density of the blanks in the bolt hole areas is increased even more due to the interposition of the metal washer.

3,941,641

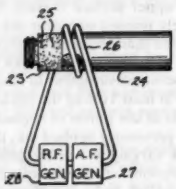
BONDING METHOD AND APPARATUS

William C. Heller, Jr., Milwaukee, Wis., and Alfred F. Leatherman, Columbus, Ohio, assignors to William C. Heller, Jr., Milwaukee, Wis.

Filed Feb. 26, 1974, Ser. No. 445,983

Int. Cl.² B29C *27/04*

U.S. Cl. 156—272 19 Claims



1. A method of joining adjoining surfaces of material adapted to be temporarily placed in a movable state, comprising the steps of interposing a plurality of particles at the interface of the surfaces to be joined, said particles being selected to follow orientation of an energy field and thereby physically move at the surfaces in response to a changing energy field, and subjecting said particles to said changing energy field with a rate of change providing a significant physical movement of said particles to enhance the joinder of the materials at the interface.

3,941,642

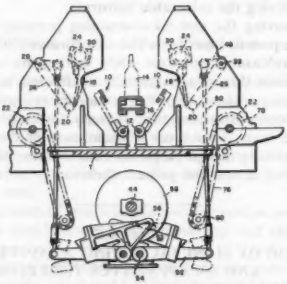
DRIVEN TRANSFER ROLL FOR LABELING MACHINE

Edward A. Schnier, Hubbardston, Mass., assignor to A-T-O, Inc., Cleveland, Ohio

Division of Ser. No. 243,637, April 13, 1972, Pat. No. 3,880,115. This application May 9, 1974, Ser. No. 468,515

Int. Cl.² B05D *1/28*

U.S. Cl. 156—297 2 Claims



1. In a method of applying labels wherein there is a picker reciprocably movable between a label magazine and a transfer position for transferring labels to a gripper assembly at the transfer position whereupon the gripper assembly takes the label from the picker and applies it to a container and wherein there is a rotating adhesive pickup roll supported in a container of adhesive and a transfer roll reciprocably movable in timed relation to the movement of the picker to transfer a uniform coating of adhesive from the pick-up roll to the surface of the picker, the improvement comprising using a picker having a surface of a predetermined length with an adhesive transfer roll having a circumferential surface of lesser length than said predetermined length and effecting rotational movement of the transfer roller against said picker at such a rate as to cause said transfer roller to make only one complete turn

while traveling from one end to the other of said picker surface so as to produce a uniform coating on the entire surface of the picker.

2. In a method of applying labels wherein there is a surface of a first predetermined length to receive a uniform coating of adhesive and wherein there is a rotating adhesive pick-up roll supported in a container of adhesive and a transfer roll reciprocably movable in timed relation to the first predetermined surface to transfer a uniform coating of adhesive from the pick-up roll to the surface of the first predetermined length, the improvement comprising using a surface having a first predetermined length with an adhesive transfer roll having a circumferential surface of lesser length than said first predetermined length and effecting rotational movement of the transfer roller against said first predetermined length at such a rate as to cause said transfer roll to make only one complete turn while traveling from one end to the other of said first predetermined length so as to produce a uniform coating on the entire surface of the first predetermined length.

3,941,643

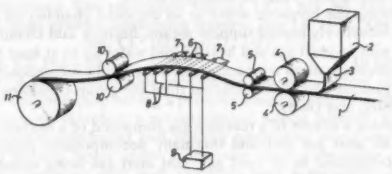
APPARATUS FOR THE MANUFACTURE OF LAMINATED PACKING MATERIAL CONTAINING METAL FOIL

Gyula Balla, Malmo, Sweden, assignor to Tetra Pak International AB, Lund, Sweden

Division of Ser. No. 296,922, Oct. 12, 1972, abandoned. This application Dec. 20, 1973, Ser. No. 426,782

Int. Cl.² B23K *13/00;* **B29B** *27/04*

U.S. Cl. 156—380 **1 Claim**



1. Apparatus to laminate a thermoplastic material to a web of metal foil comprising: a means to supply a web of metal foil, means to extrude a layer of thermoplastic material on said web of metal foil at a temperature below the oxidation temperature of said thermoplastic material, a source of high frequency current including a plurality of substantially parallel insulated metal bars coupled together and forming an arched path in the direction of travel of the metal foil, a pair of cooled pressure rollers located between said extruder and said metal bars, means to pass said metal foil with thermoplastic thereon through said cooled pressure rollers and over said metal bars in an arcuate path and means to compress said layers of material after they pass over the metal bars.

3,941,644

APPARATUS FOR GUIDING A STRIP TO A SUPPORT SURFACE

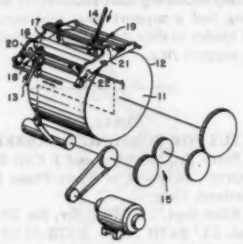
Norman Edward Klein, and Kenneth James Addis, both of Inman, S.C., assignors to Deering Milliken Research Corporation, Spartanburg, S.C.

Filed Oct. 9, 1973, Ser. No. 404,328

Int. Cl.² B29H *9/04;* **B65H** *81/08*

U.S. Cl. 156—433 **7 Claims**

1. Apparatus for positioning a continuous strip on a movable support surface in a zigzag pattern including a traversing guide member having a slot passage disposed longitudinally of the movement of said support surface, means for reducing friction in the slot passage of said guide member, and a pair of interconnected, pivotable, cam-actuated finger means coordinated with the traverse of said guide member disposed between said guide member and said support surface alternately movable into the path of said strip at the ends of each



traverse of said guide member to form the reversals of the zigzag pattern.

3,941,645

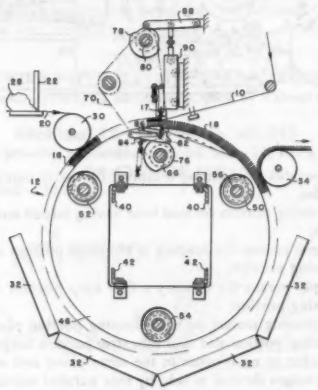
CARPET MACHINE

Charles A. Wethington, Spartanburg, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Continuation of Ser. No. 403,744, Oct. 5, 1973, abandoned, which is a continuation of Ser. No. 252,974, May 15, 1972, abandoned. This application July 2, 1974, Ser. No. 485,119

Int. Cl.² B32B *5/00;* **D05C** *15/00*

U.S. Cl. 156—435 **2 Claims**



1. Apparatus to produce a bonded pile fabric comprising: a rotor, means to rotate said rotor, means slidably mounting a plurality of blades in said rotor, a second single blade member reciprocably mounted above said plurality of blades and operably associated therewith, means to supply yarn between said plurality of blades and said second blade member, means to move said second blade member downwardly at a predetermined time to bend the yarn over one blade of said plurality of blades, means to slide upwardly the blade of said plurality of blades next adjacent to the blade over which the yarn is bent to form a loop in said yarn, means to move said single blade member upwardly away from the formed loop, means to index said rotor to rotate said rotor a predetermined distance to place the blade members in loop forming position, means to supply an adhesive backed backing material into contact with said formed loop, means to set the bond between said adhesive and said loop and means to guide said backing material with loops bonded thereto away from said apparatus, said rotor including a means to maintain said blades of said plurality of blades in said loops until said rotor is indexed to a point

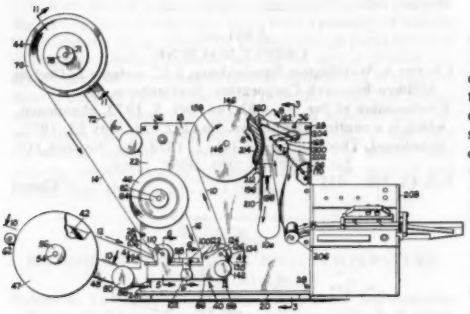
where a formed loop is guided away from said apparatus and a means to allow said plurality of blades to slide downwardly after the formed loop is guided away from said apparatus, said means slidably mounting said plurality of blades including a notched ring and a support ring, said means to allow said plurality of blades to slide downwardly including a section cut out of said support ring.

3,941,646

APPARATUS FOR FORMING A TABBED FILM STRIP

Chester H. Petry, Jr., Newberg, and J. Carl Hensley, Portland, both of Oreg., assignors to Byers Photo Equipment Company, Portland, Oreg.

Filed Sept. 25, 1972, Ser. No. 291,945
Int. Cl.² B65H 21/00; B32B 31/08, 31/20
U.S. Cl. 156—545 5 Claims



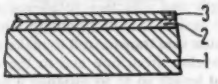
1. Apparatus for forming a tabbed film strip comprising
a. a base,
b. a forming portion on said base having infeed and outfeed ends,
c. supply means for feeding a tab strip portion onto said forming portion,
d. supply means for feeding a film strip portion onto said forming portion,
e. positioning means on said forming portion placing said tab strip portion and said film strip portion longitudinally adjacent to each other in the same plane and with adjacent edges thereof in side by side parallel relation,
f. said positioning means comprising a longitudinal surface defined laterally by side rails between which the respective strip portions are received and including a dividing projection between said rails extending through only a portion of the length of the said longitudinal surface, the area between said projection and one side rail that is to receive said tab strip portion being of less width than said tab strip portion to cause the latter to buckle laterally when received therein whereby as said strip portions pass beyond said dividing projection the buckled strip portion straightens out and expands laterally so as to be in adjacent edge relation and in the same plane as the other strip portion as aforesaid,
g. feed supply means for a continuous length connecting strip which has less width than the combined width of said tab and film strip portions,
h. roller means applying said connecting strip in overlapping relation on adjacent marginal surface areas of both of said tab and film strip portions to secure said strip portions together and form a tabbed film strip,
i. and drive means pulling said tabbed film strip from said forming portion.

3,941,647

METHOD OF PRODUCING EPITAXIALLY SEMICONDUCTOR LAYERS

Manfred Druminski, Vaterstetten, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 8, 1973, Ser. No. 339,216
Int. Cl.² B44D 1/18
U.S. Cl. 156—612 12 Claims



1. A process of producing an epitaxially deposited semiconductor layer uniformly composed of a material selected from the group consisting of silicon and germanium onto a substrate composed of a material selected from the group consisting of sapphire and a Mg-Al spinel, comprising the sequential steps of:

preparing a wafer of said substrate for expitaxial deposition by cutting, polishing along specific crystal planes and freeing said wafer of damaged layers;

placing the prepared wafer in an enclosed chamber on an inductively heated support means, flushing said chamber with an inert gas and heating said wafer up to at least the decomposition temperature of a thermally decomposable gaseous compound selected from the group consisting of SiH_4 and GeH_4;

passing a stream of a reaction gas composed of a mixture of an inert gas and said thermally decomposable gaseous compound in an inert gas, said inert gas being selected from the group consisting of hydrogen and helium, through said chamber while maintaining said temperature of said wafer for a period of time sufficient to relatively quickly deposit a continuous seed layer of said material onto at least one surface of said wafer; and

substantially simultaneously maintaining said stream of said reaction gas about said wafer and maintaining said temperature of said wafer while adding only a gaseous hydrogen halide selected from the group consisting of hydrogen chloride and hydrogen bromide to said stream of reaction gas for a period of time sufficient to relatively slowly deposit a further layer of said material onto said seed layer.

3,941,648

CRYSTAL GROWTH ON HG_3TEO_6

Zvi Blank, Morris Plains, N.J., assignor to Allied Chemical Corporation, New York, N.Y.

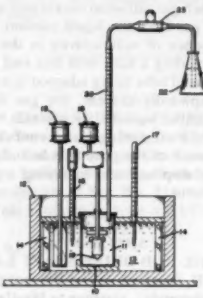
Filed Jan. 31, 1975, Ser. No. 545,952
Int. Cl.² B01J 17/04; C01G 13/00
U.S. Cl. 156—622 6 Claims

1. A process for growing single crystals of mercury tellurate (Hg_3TeO_6) on rotating seed crystals of Hg_3TeO_6 from a slightly undersaturated highly acidic aqueous solution of pH near 0 at an elevated temperature which comprises

a. adding a hydrolyzing compound having a controllable rate of hydrolysis to the slightly undersaturated aqueous solution maintained under substantially isothermal conditions to increase the pH of the solution to a value of about 1.5 substantially homogeneously throughout the solution

and to effect crystal growth; and

b. then slowly reducing the solution temperature to about



room temperature at substantially constant pH to complete the crystal growth.

3,941,649

PROCESS FOR OBTAINING A PREDETERMINED KAPPA NUMBER IN SULFATE PULPING

Erik Gunnar Wallin, Domsjoverken, Sweden, assignor to Mo och Domsjo Aktiebolag, Ornskoldsvik, Sweden

Continuation-in-part of Ser. No. 378,768, July 12, 1973, abandoned. This application Nov. 23, 1973, Ser. No. 418,634

Claims priority, application Sweden, July 14, 1972, 9341/72

Int. Cl.² D21C *3/22, 3/24, 7/12*

U.S. Cl. 162—19 **10 Claims**

1. A fully controllable process for the manufacture of sulfate cellulose pulp having a predetermined degree of delignification and therefore a predetermined Kappa number, which comprises combining and holding particulate wood and sulfate pulping liquor under preliminary alkali-consuming reaction conditions until such reactions have substantially been completed and before substantial delignification has begun; taking a sample of the pulping liquor at this stage of the process; analyzing the sample and obtaining the content of alkali in the liquor; adjusting the alkali content to at least 20 g calculated as NaOH per kilogram of wood initially added, by addition of alkali; from this alkali content determining the pulping intensity expressed as H factor for obtaining the desired kappa number in the sulfate cellulose pulp; and controlling the pulping time and pulping temperature during delignification, according to this "H" factor, in order to obtain said desired kappa number.

3,941,650

CONTINUOUS DIGESTER

Auxilius P. Schnyder, 146 Cherry Lane, Teaneck, N.J. 07666

Filed Aug. 9, 1974, Ser. No. 496,305

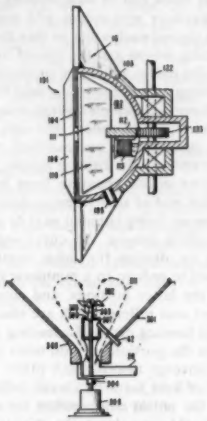
Int. Cl.² D21C *7/00*

U.S. Cl. 162—237 **10 Claims**

1. A continuous digester for comprising:

a vessel; means for introducing chips into the upper portion of the vessel; means for introducing fresh cooking liquor into said upper portion of said vessel; means for withdrawing digested wood chips from the lower part of the vessel; and liquor withdrawing means positioned at vertically spaced points in said vessel, each said liquor withdrawing means comprising a circumferential disposed liquor drain compartment in fluid flow communication with the vessel interior; a screen positioned between the interior of the vessel and said liquor drain compartment whereby liquor flows from the interior of the vessel through said screen into said liquor drain compartment; and screen cleaning means positioned in said drain compartment for circumferential movement thereby backwashing said screen to prevent plugging of said screen.

9. The digester of claim 8 wherein the means for introducing liquor into the lower conical portion of said vessel com-



prises, a housing in the lower conical portion of said vessel positioned immediately below said impeller, said housing including a plurality of orifices for introducing liquor from the housing into the vessel immediately below the impeller; and inlet means for introducing liquor into the housing.

3,941,651

TWIN-WIRE PAPER MANUFACTURING MACHINES

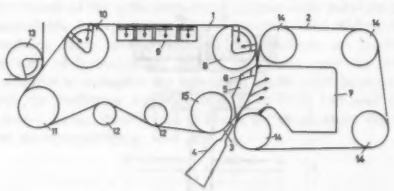
Erkki Koski, Jyvaskyla, Finland, assignor to Valmet Oy, Finland

Filed Mar. 22, 1974, Ser. No. 453,813

Claims priority, application Finland, Mar. 23, 1973, 919/73

Int. Cl.² D21F *1/00*

U.S. Cl. 162—301 **8 Claims**



1. In a twin-wire paper manufacturing machine, stationary forming means having front and rear ends and an outer convex forming surface extending between said front and rear ends, endless main wire means surrounding and engaging said forming means so that a portion of said main wire means assumes the curvature of said forming surface for moving therealong from said front to said rear end thereof, main roller means guiding said main wire means for movement along said forming surface of said forming means, said main roller means including a pair of rollers respectively situated adjacent and before and after said front and rear ends of said forming means for guiding a portion of said main wire means to and from said front and rear ends of said forming means, auxiliary endless wire means and auxiliary roller means engaging said auxiliary wire means to guide the latter for movement, said auxiliary roller means also including a pair of rollers respectively situated adjacent said front and rear ends of said forming means for guiding a portion of said auxiliary wire means to and from the regions of said front and rear ends of said forming means for providing said auxiliary wire means with a

portion also assuming the curvature of said forming surface and capable of moving concurrently with said portion of said main wire means which travels along said forming surface, the rollers of said main and auxiliary roller means which are situated before said front end of said forming means providing said main and auxiliary wire means with converging portions which converge toward each other as they approach said front end of said forming means and the pair of rollers of said main and auxiliary roller means which are situated adjacent the rear end of said forming means providing said main and auxiliary wire means with portions which diverge away from each other between the latter pair of rollers and said rear end of said forming means as said main and auxiliary wire means move beyond the rear end of said forming means, so that said main and auxiliary wire means separate from each other at the region of the rear end of said forming means, said main and auxiliary wire means being situated next to each other only at their portions which assume the curvature of said forming surface, means for driving the latter portions at the same angular velocities to reduce to a minimum the relative movement between the latter portions, and stock feeding means situated adjacent said rollers which are situated adjacent the front end of said forming means for feeding stock into a space defined between the portions of said main and auxiliary wire means which converge toward each other as they approach said front end of said forming means, whereby initial web formation and the entire compression between both of said wire means take place only at those portions of said wire means which move concurrently along said stationary forming means.

3,941,652

FAILED FUEL DETECTION FOR NUCLEAR REACTOR

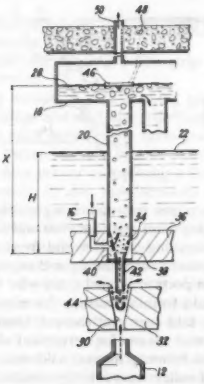
Jean-Paul Delisle, Manosque; Raymond Pochard, Versailles; Robert Porte, Le-Mesnil-St.-Denis, and Lucien Prouteau, Maurepas, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Sept. 15, 1971, Ser. No. 180,715

Claims priority, application France, Sept. 22, 1970, 70.34314

Int. Cl.[2] G21C *17/04*

U.S. Cl. 176—19 LD **7 Claims**



1. Apparatus for locating failed fuel assemblies in a nuclear reactor cooled by upward flow of liquid coolant through the fuel assemblies, comprising gas source means for supplying gas at a pressure greater than the pressure of liquid coolant at the outlet of each assembly, emulsion producing means for producing an emulsion between the gas and the liquid coolant, the emulsion producing means including an enclosed flow path for each assembly adapted to receive a portion of the liquid coolant flowing from the outlet thereof, the emulsion producing means further including gas diffusion means connected to the flow path and adapted to receive gas from the gas source means and introduce the gas into liquid coolant flowing through the flow path, selector means for successively supplying gas to each gas diffusion means one at a time, means for separating the gas from the liquid coolant, and means for detecting the presence of radioactivity in the separated gas, each flow path including a tube with one end near the outlet of a fuel assembly, said tube being adapted to enable the liquid coolant to flow upwardly therein, the gas diffusion means including a gas chamber bounded on one side by said tube and on the other side by a supporting plate connected to the selector means, the portion of the tube that bounds the gas chamber being laterally disposed and including a plurality of gas inlet apertures therein.

3,941,653

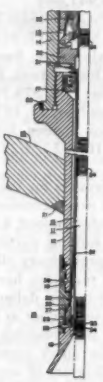
CONTROL ROD DRIVE SHAFT LATCH

Arthur G. Thorp, II, deceased, late of Pittsburgh, Pa. (by Ruth S. Thorp, administratrix), assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 712,338, March 8, 1968, abandoned. This application Oct. 5, 1971, Ser. No. 186,616

Int. Cl. G21c *7/00*

U.S. Cl. 176—36 R **6 Claims**



1. In a nuclear reactor, in combination, a reactor vessel having a relatively high internal pressure, a longitudinally movable control rod drive shaft, a control rod drive mechanism disposed externally of the reactor vessel, sealed housing means for the mechanism having substantially the entire interior thereof open to the interior of said vessel so as to be subjected to the internal pressure in the reactor vessel, motive means for moving the drive shaft longitudinally and incrementally, a latch device positioned adjacent to and movable into and out of engagement with said drive shaft and mounted on a support to prevent movement of said control rod shaft when in engagement therewith, said latch device being positioned out of engagement with the control rod drive shaft when said housing means is sealed, cam surfaces fixedly positioned with respect to the housing and complementary cam surfaces on said latch device movable into engagement with said fixed cam surfaces to move said latch device into engagement with said drive shaft, and movable differential pressure responsive means having opposed sides and located in said housing means adjacent the area of joinder of said housing and said vessel, said last-mentioned differential pressure means being coupled to said latch device and exposed to said internal pressure, said differential pressure means being positioned within said housing with said pressure on opposed sides of said differential pressure means being balanced when said housing means is sealed such that said latch device is out of engagement with

said drive shaft yet becomes unbalanced in the event of a break in said housing means at a location on the side of said differential pressure means remote from said vessel and moves in response to said unbalance to engage said fixed and complementary cam surfaces and thereby engage the latch device with the drive shaft.

3,941,654

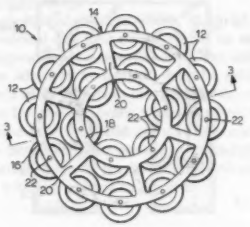
TUBULAR FUEL CLUSTER

Walter Renald Tarasuk, and Isao David Yonemitsu, both of Peterborough, Canada, assignors to Canadian General Electric Company Limited, Toronto, Canada

Continuation-in-part of Ser. No. 216,447, Jan. 10, 1972, abandoned. This application June 4, 1973, Ser. No. 366,703

Int. Cl. G21c *15/02*

U.S. Cl. 176—61 **4 Claims**



1. In a liquid cooled nuclear reactor having a plurality of fuel channels extending in substantially parallel mutually spaced relation, each channel having an inlet for liquid coolant adjacent one end thereof and an outlet for liquid coolant adjacent the other end thereof wherein a said channel and the fuel charge therein comprises an elongated cylindrical pressure tube having a said coolant inlet and a said coolant outlet connected therewith to receive and discharge respectively pressurized coolant liquid, a plurality of fuel bundles in abutting end-to-end relation within the channel, each bundle comprising a plurality of substantially mutually parallel longitudinally extending fuel elements positioned substantially parallel with the longitudinal axis of the channel in symmetrical spaced relation to substantially transversely fill the channel, including a plurality of hollow tubular elements each having an axially extending internal coolant flow path extending through the element interior and an external coolant flow path about the element exterior surface, and a plurality of apertured flow restriction plate means secured to the ends of said fuel bundles each plate means having a flow restricting orifice in axially aligned relation with a respective element internal flow path to limit the flow of coolant therethrough, the plates being thus spaced along the length of said channel in flow controlling relation with said internal coolant flow paths to provide in use a progressive, controlled pressure drop between said channel coolant inlet and said channel coolant outlet to substantially preclude flashing of said liquid coolant from a liquid phase to a gaseous phase on passage through the interior of the hollow elements of said fuel charge.

3,941,655

METHOD FOR RECOVERING XYLOSE ISOMERASE

Robert E. Heady, Park Forest, and William A. Jacaway, Jr., Downers Grove, both of Ill., assignors to CPC International Inc., Englewood Cliffs, N.J.

Division of Ser. No. 401,757, Sept. 28, 1973, Pat. No. 3,847,740, which is a continuation-in-part of Ser. No. 294,397, Oct. 2, 1972, Pat. No. 3,847,741. This application Oct. 10, 1974, Ser. No. 513,910

The portion of the term of this patent subsequent to Nov. 12, 1991, has been disclaimed.

Int. Cl.² C07G *7/028;* **C12D** *13/10, 13/02*

U.S. Cl. 195—31 F **8 Claims**

1. A method for recovering xylose isomerase from a fermentation broth comprising:

contacting a fermentation broth containing xylose isomerase which is contained in the microbial cells where it is formed with basic magnesium carbonate and in a subsequent step, releasing the xylose isomerase from its microbial cells in the presence of basic magnesium carbonate to thereby sorb the sylose isomerase on the basic magnesium carbonate.

3,941,656

MANUFACTURE OF CITRIC ACID BY SUBMERGED FERMENTATION

Helmut Hustede, Ladenburg (Neckar), Germany; Hermann Rudy, deceased, late of Heidelberg, Germany; by Liselotte Rudy, nee Ringelmann, heir; by Hans Rudy, heir, both of Heidelberg, Germany, and by Barbara Sallewsky, nee Rudy, heir, St. Hermas, Canada, assignors to Joh. A. Benckiser GmbH, Ludwigshafen (Rhine), Germany

Filed Nov. 2, 1971, Ser. No. 195,007

Int. Cl. C12d *1/04*

U.S. Cl. 195—36 R **22 Claims**

1. In the process of producing citric acid by submerged aerobic fermentation with a citric acid-producing microorganism in a sterilized carbohydrate-containing growth medium containing complexable substances and assimilable heavy metals, the improvement which comprises adding to the medium not later than its sterilization, a first amount of ferrocyanide ions in an amount necessary to complex only one-third to two-thirds of the total amount of complexable substances and assimilable heavy metals of the medium, and adding to the medium after sterilization of the medium an additional amount of ferrocyanide ions in an excess over the amount sufficient to complex the remaining assimilable heavy metals and the buffering capacity of the medium but said excess amount being insufficient to block the respiratory system of the microorganism.

3,941,657

PURIFICATION OF D-AMINOACID OXIDASE

Honore Mazarguil, Ramonville-St. Agne; Francois Meiller, Palaiseau, and Pierre Monsan, Toulouse, all of France, assignors to Rhone-Poulenc Industries, Courbevoie, France

Filed Apr. 16, 1975, Ser. No. 568,797

Claims priority, application France, Apr. 22, 1974, 74.13865

Int. Cl.² C07G *7/02*

U.S. Cl. 195—66 R **4 Claims**

1. A process for the separation and purification of d-aminoacid oxidase, which comprises contacting a solution of a mixture of proteins containing the d-aminoacid oxidase with a carrier onto which the enzyme is fixed, then separating the d-aminoacid oxidase from the carrier, characterized in that the carrier is a mineral carrier bearing haloalkylsilane grafts modified by fixing residues having the formula $-NH-(CH_2)_3-NH-(CH_2)_2C_6H_4COOH$, and that the purified d-aminoacid oxidase is separated from the carrier by dissolution in a solution of ethyleneglycol.

3,941,658

METHOD FOR DETERMINATION OF THE PRESENCE OF ANTIBIOTICS

Sophia Adriana Lamèris, Hague; Jan Lambert van Os, Voorburg, and Joannes Gerard Oostendorp, Rijswijk-Zh, all of Netherlands, assignors to Gist-Brocades N.V., Delft, Netherlands

Filed May 22, 1974, Ser. No. 472,511

Claims priority, application United Kingdom, May 31, 1973, 25947/73

Int. Cl.² C12K *1/04*

U.S. Cl. 195—103.5 R **27 Claims**

1. A method for the rapid determination of the presence or absence of residues of antibiotic in liquids and meat comprising introducing spores of a microorganism which possesses a high sensitivity for the antibiotic to be determined in an agar medium so that the spores are prevented from starting to germ by lack of nutrients, but stay alive, and being sufficiently heavily inoculated that after addition of nutrients and incubation at or near optimal temperature in a short time sufficient growth has proceeded that growth is indicated by an indicator added either to the agar medium or to the nutrients, the resulting spore and agar mixture being allowed to solidify in upright test vessels having a cross-sectional dimension sufficiently small to require as little of the agar medium as possible, but sufficiently large to enable a correct determination of inhibition of growth of the microorganism to be made and having a height so that the vessel can contain a sufficient amount of medium and a sufficient amount of sample liquid to be tested, placing on the agar surface dried nutrients, in the form of a filter paper disc or tablet, required for growth, adding a predetermined amount of sample liquid to be tested to the test vessel, and incubating at or near optimal temperature the contents of the test vessel for a predetermined time so that the extent of growth or inhibition of growth of the microorganism read in a vertical sense indicates absence or presence of antibiotic.

3,941,659

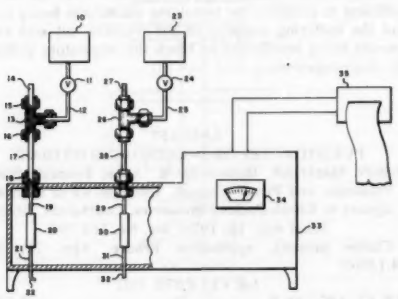
BLOOD ALCOHOL ANALYZER

Robert B. Koch, Starkville, Miss., and John D. Skogen, Burnsville, Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed July 11, 1974, Ser. No. 487,710

Int. Cl.² C12K *1/04*; C07G *7/02*

U.S. Cl. 195—103.5 R **5 Claims**



1. In a method of determining the concentration of an alcohol of interest in a sample wherein the detection of the concentration or change therein of the indicating species $NADH_2$ produced by the reaction of said alcohol with NAD in a buffered carrier solution in the presence of the enzyme ADH wherein said ADH is immobilized by physical entrapment in a cross-linked polyacrylamide gel in a manner which allows free contact between the species in the buffered carrier solution and the enzyme molecules with little or no loss of enzyme into said carrier solution thereby and wherein after said reaction is substantially complete, the reacted solution is caused to fluoresce, said fluorescence is measured and an output indicative of said fluorescence is generated, the improvement comprising the step of adding a quantity of one or more stabilizers selected from the group consisting of:

Ammonium Sulfate (0.1 M to 1.0 M)

Dithiothrietol (approximately 0.001 M)

Glycine (approximately 1%)

Sodium Pyrophosphate (approximately 3%)

Zinc Chloride (approximately 0.01 M)

and during the gelling of said gel.

3,941,660

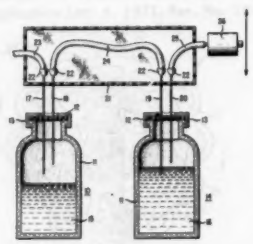
METHOD AND APPARATUS FOR DETECTING MICRO-ORGANISMS

Jeffrey Mirsky, 379 Morris Ave., Mountain Lakes, N.J. 07646

Filed Jan. 20, 1975, Ser. No. 542,259

Int. Cl.² C12K *1/04*

U.S. Cl. 195—103.7 **26 Claims**



1. Apparatus for detecting micro-organisms in a sample comprising:

a first sealed container into which the sample may be introduced including therein a radioactive nutrient medium which is capable of supporting the life process of the micro-organisms to be detected;

a second sealed container including therein a solution which is capable of absorbing the radioactive metabolic product of the micro-organisms in said sample and emitting light in response thereto; and

means for coupling together the first and second containers so that the radioactive metabolic product produced by the micro-organisms of the sample in the first container may be introduced into said second container without contamination of the contents of said containers by the environment and without physical contact of the medium with any portion of the second container.

20. A method of detecting micro-organisms in a sample comprising the steps of:

introducing said sample into a sealed container defining a volume which includes therein a radioactive nutrient medium which is capable of supporting the life process of the micro-organisms to be detected;

coupling together the volume of said first container with the volume defined by a second sealed container which includes therein a solution capable of absorbing the radioactive metabolic product of the said sample and emitting light in response thereto, so that the metabolic product produced in said first container is introduced into said second container, said coupling being done without exposure of the contents of the container to the environment;

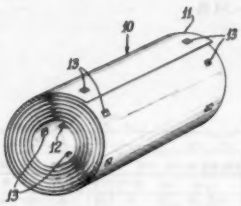
de-coupling the volumes of the two containers; and

measuring the light emitted by the solution in said second container in response to the metabolic product of the micro-organisms of the sample.

3,941,661
ROLLER CULTURE BOTTLE INSERT

William D. Noteboom, Columbia, Mo., assignor to The Curators of the University of Missouri, Columbia, Mo.

Filed Jan. 16, 1974, Ser. No. 433,686
Int. Cl.² C12K 9/00
U.S. Cl. 195—127 5 Claims



1. Apparatus for use in a roller culture bottle that is partially filled with a culture medium for the growing of cells or microorganisms and comprising:

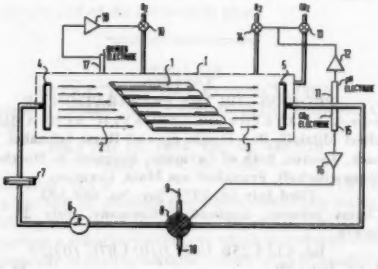
a continuous elongated sheet of plastic material wound into a tight cylindrical coil and thermally set so as to retain a spiral configuration for insertion into the culture bottle and further adapted to expand into an enlarged spiral configuration after insertion into the bottle, and

spacing means formed integrally with said sheet for separating successive layers of said spiral when present within the culture bottle so as to permit the passage of culture medium therethrough as the bottle is rolled about an axis coincident with the axis of said spiral.

3,941,662
APPARATUS FOR CULTURING CELLS

Paul Gerhard Munder, Emmendingen; Manuel Modolell, Bollschweil, both of Germany, and Donald Francis Hoelzl Wallach, Boston, Mass., assignors to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V., Goettingen, Germany

Division of Ser. No. 260,629, June 7, 1972, Pat. No. 3,873,423.
This application Mar. 21, 1975, Ser. No. 560,632
Claims priority, application Germany, June 9, 1971, 2128744
Int. Cl.² C12B 1/00
U.S. Cl. 195—127 8 Claims



1. Apparatus for culturing cells comprising, in combination:

a. a substantially gas-tight incubator enclosure;

b. support means in said enclosure;

c. a plurality of containers on said support means,

1. each container essentially consisting of chemically inert material permeable to gas, but impermeable to liquid;

d. pump means for circulating a stream of liquid culture medium through said containers;

e. first detecing means for sensing the pH value of the circulating culture medium;

f. second detecting means for sensing the partial pressure of oxygen in said enclosure outside said containers;

g. a source of carbon dioxide under pressure;

h. a source of oxygen under pressure;

i. first valve means interposed between said source of carbon dioxide and said enclosure and operatively connected to said first detecting means for admitting said carbon dioxide to said enclosure in response to the sensed pH value;

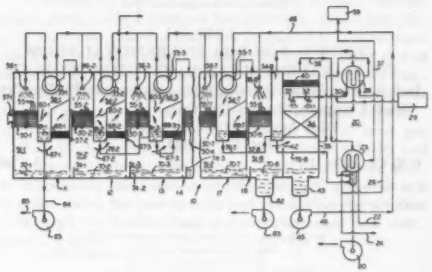
j. second valve means interposed between said source of oxygen and said enclosure and operatively connected to said second detecting means for admitting said oxygen to said enclosure in response to the sensed partial pressure; and

k. means for maintaining a substantially constant total gas pressure in said enclosure.

3,941,663
MULTI-EFFECT EVAPORATOR

Armando B. Steinbruchel, San Diego, Calif., assignor to Aqua-Chem, Inc., Milwaukee, Wis.

Filed July 3, 1972, Ser. No. 268,611
Int. Cl.² B01D 3/02
U.S. Cl. 202—174 10 Claims



1. An evaporator having a plurality of effects, a plurality of said effects including an outer housing portion disposed with its axis substantially horizontal and being generally curvilinear in a plane transverse to said axis,

each housing portion including first and second pairs of spaced substantially vertical walls disposed in a substantially rectangular array, one of the walls of said first pair intersecting a first part of said housing portion to form therewith a vapor distributine space and a second one of the first pair of said walls intersecting a second part of said housing to form therewith a distillate collecting chamber,

said first and second pairs of vertical walls defining an evaporating space with the upper and lower margins of said housing,

a plurality of heat exchange tubes extending substantially horizontally through said evaporation space and between said first pair of vertical walls and opening at one end into said vapor distributing space and at their other ends into said distillate collecting space,

a first one of said second pair of vertical walls of each effect being disposed at one end of said housing portion and the other of said second pair of walls being disposed intermediate the ends of said housing portion and extending from the upper end thereof and defining a vapor receiving space with the other end of said housing portion, an aperture formed in the lower end of the other one of said second pair of vertical walls for connecting said evaporating space to said vapor receiving space whereby vapor

generated in the evaporating space of each effect is flowed downwardly and through said aperture,

feed liquid distributing means disposed in said evaporating space and above said heat exchange tubes for distributing feed liquid as a thin film over the outer surfaces of said tubes,

the housing portions of each effect being joined end to end in a substantially horizontal array to form a unitary housing for said evaporator,

means for coupling the vapor distributing space of the first one of said effects to a source of steam, means for coupling the evaporating space of the last one of said effects to condensing means,

the first one of the second pair of walls of each effect having a first opening formed therein and communicating with the vapor receiving space of the respective next higher effect for passage of vapor to the vapor distributing spaces of said effects from said respective next higher effects,

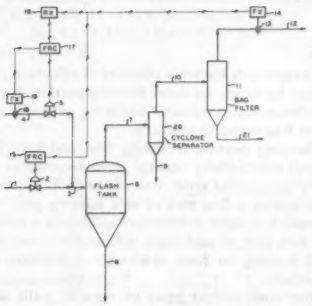
a second opening formed in the lower end of the first one of said second pair of walls of each effect for permitting the flow of unevaporated feed liquid between effects,

and feed liquid preheater means disposed in at least some of said effects and including a preheater housing surrounding said feed liquid preheater means and having an opening formed therein, said opening being coupled to the condensate collecting space of its respective effect for conducting uncondensed vapor exiting from the effect heat exchange tubes to said feed liquid preheater means.

3,941,664
CONTROL FOR DILUENT REMOVAL FROM POLY(ARYLENE SULFIDE) REACTOR PRODUCT

Jack S. Scoggin, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 29, 1972, Ser. No. 284,462
Int. Cl.² B01D *3/42*
U.S. Cl. 203—1 **3 Claims**



1. In a process for recovering polar organic diluent from reactor effluent slurry comprising poly(arylene sulfide), polar organic diluent, alkali metal halide, and reaction impurities, by mixing the reactor effluent with steam and reducing the pressure to flash the mixture, with a method for control, the improvement comprising:

1. generating a signal characteristic of the flow rate of flashed vapor from the flashing operation;
2. controlling the rate of flow of effluent from the reactor in response to said signal; and
3. controlling the rate of flow of steam admixed with the reactor effluent in predetermined ratio to the flow of flashed vapor in response to said signal.

3,941,665
CATION CONCENTRATION MEASUREMENTS

Edgar L. Eckfeldt, Ambler; William E. Proctor, Norristown, and James U. Eynon, Willow Grove, all of Pa., assignors to Leeds & Northrup Company, Philadelphia, Pa.

Division of Ser. No. 750,388, Aug. 5, 1968, abandoned. This application Dec. 3, 1971, Ser. No. 204,773
Int. Cl.² G01N *27/46*
U.S. Cl. 324—30 R **2 Claims**

1. A method of calibrating a system for measuring ion concentration including an analyzer cell having an electrode which produces a voltage representing the concentration of selected ions in contact with said electrode and a meter having an indicator which moves over a meter scale in accordance with the voltage on said electrode and an auxiliary scale on said meter movable with respect to said fixed scale comprising:

supplying to said analyzer cell a first sample having unknown concentration c_a,

moving said auxiliary scale to a position such that a reference mark on said auxiliary scale corresponds with the position of said indicator when said first sample is in said analyzer cell,

supplying a second sample liquid having a concentration which is a known increment c_i above the concentration c_a,

determining from said auxiliary scale the actual concentration of said second sample as indicated by the position of said indicator with respect to calibration markings on said second scale, and

adjusting the zero adjustment of said meter so that said indicator reads said value of actual concentration on said meter scale when said second sample is in said analyzer cell.

3,941,666
PROCESS FOR THE PREPARATION OF N-(α-ALKOXYETHYL)-CARBOXYLIC ACID AMIDES

Michael Mitzlaff, Bad Homburg, and Horst Schnabel, Steinbach, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed July 18, 1974, Ser. No. 489,533
Claims priority, application Germany, July 20, 1973, 2336976
Int. Cl.² C25B *3/02, 3/10;* **C07C** *103/30*
U.S. Cl. 204—79 **11 Claims**

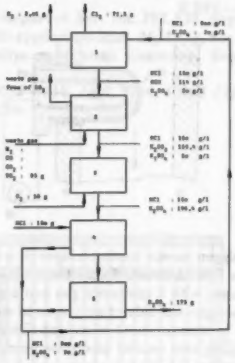
1. A process for the preparation of N-(α-alkoxyethyl)-carboxylic acid amides which comprises partially neutralizing an N-acyl-α-aminopropionic acid to convert from 3 to 50 mole % of the acid groups thereof to alkali metal salt groups, preparing an alcoholic solution of said partially neutralized N-acyl-α-aminopropionic acid and electrolyzing said solution to convert said partially neutralized N-acyl-α-aminopropionic acid into an N-(α-alkoxyethyl)-carboxylic acid amide.

3,941,667

METHOD FOR THE REPROCESSING OF CELL LIQUOR FROM DIAPHRAGM CELL ELECTROLYSIS PLANTS

Georg Von Semel, Dortmund; Eduard Schibilla, Dortmund-Solde, and Wolfgang Strewe, Dortmund, all of Germany, assignors to Friedrich Uhde GmbH, Dortmund, Germany

Filed Mar. 21, 1975, Ser. No. 560,707
Int. Cl.² C25B *1/16, 1/26;* C01D *5/04*
U.S. Cl. 204—98 3 Claims



1. Method for reprocessing cell liquor from a diaphragm cell electrolysis plant having potassium chloride brine cycle comprising

1. removing an effluent cell liquor solution from the diaphragm cell electrolysis plant,
2. contacting the solution with an SO_2-bearing gas,
3. oxidizing the solution with an oxygen-bearing gas,
4. adding a predetermined quantity of KCl to the oxidized solution,
5. subjecting the solution to a filtration and precipitation step, and
6. recycling the solution as a make-up brine to the diaphragm cell of the electrolysis plant.

3,941,668

REFRACTORY ORE BENEFICIATION

Benjamin W. Allan, 3205 Cornwall Drive, Glendale, Calif. 91206

Filed July 15, 1974, Ser. No. 488,510
Int. Cl.² C25C *1/00*
U.S. Cl. 204—105 R 16 Claims

1. a method of producing synthetic refractory oxide ore comprising:

subjecting a refractory oxide ore which includes pyrometallurgically reducible metallic values to pyrometallurgical reduction to produce a metallic-refractory oxide product, the metallic portion of said metallic-refractory oxide product being the reduced product of said pyrometallurgically reducible metallic values; and

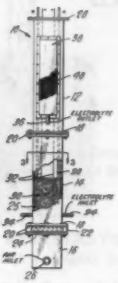
utilizing said metallic-refractory oxide product as a consumable anode in an aqueous saline electrolytic cell to solubilize at least a substantial part of the metallic portion of said metallic-refractory oxide product.

3,941,669

FLUIDIZED BED ELECTRODE SYSTEM

Nanabhai R. Bharucha, Beaconsfield, and Pierre L. Claessens, Saint-Eustache, both of Canada, assignors to Noranda Mines Limited, Toronto, Canada

Filed May 1, 1974, Ser. No. 466,085
Claims priority, application Canada, Aug. 13, 1973, 178670
Int. Cl.² C25C *1/12, 1/22, 17/12*
U.S. Cl. 204—105 R 11 Claims



7. A method for recovering a metal from a solution containing such metal using a fluidized-bed electrode system comprising an electrode chamber having a porous base, a main electrode located in such chamber and consisting of a bed of fine solid particles at least coated with metals, an auxiliary electrode insulated from said main electrode, and a current feeder extending into said bed, said method comprising the steps of:

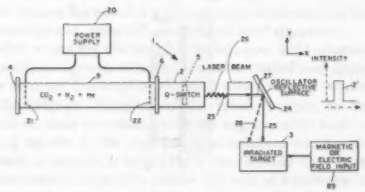
a. fluidizing said bed solely by leading air or inert gas through the porous base at a predetermined velocity and pressure to obtain a desired degree of fluidization; and
b. introducing said solution into the electrode chamber at a point above the porous base and circulating the solution through the fluidized-bed at a predetermined flow rate.

3,941,670

METHOD OF ALTERING BIOLOGICAL AND CHEMICAL ACTIVITY OF MOLECULAR SPECIES

George W. Pratt, Jr., Wayland, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Nov. 12, 1970, Ser. No. 88,528
Int. Cl.² A21D *6/00;* A61L *1/00;* B01J *1/10*
U.S. Cl. 204—158 R 36 Claims



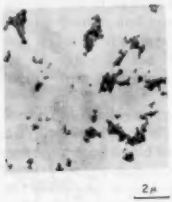
1. A method of altering the biological and/or chemical activity of macromolecular species by irradiation, that comprises, generating laser radiation at a frequency which delivers energy to said species by either directly or indirectly exciting vibrational and/or rotational states of the irradiated species, and directing said radiation upon the macromolecular species, said frequency being in the infrared frequency range.

3,941,671

STABLE DISPERSION OF HIGH MOLECULAR WEIGHT POLYTETRAFLUOROETHYLENE CONTAINING NO ADDITIVES AND A PROCESS FOR THE PRODUCTION THEREOF

Sueo Machi; Takeshi Suwa; Masaaki Takehisa, and Tadao Seguchi, all of Takasaki, Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan

Filed Feb. 22, 1974, Ser. No. 444,768
Claims priority, application Japan, Feb. 23, 1973, 48-21357
Int. Cl.² C08F 2/46
U.S. Cl. 204—159.22 7 Claims



1. A process for the production of a stable aqueous dispersion of high molecular weight polytetrafluoroethylene of molecular weight in the range of 5×10^5 to 3×10^7 and of average particle size of 0.05 to 0.3 microns, which comprises

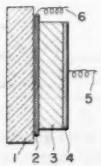
polymerizing while agitating in the substantial absence of oxygen tetrafluoroethylene monomer present in an amount of 3–50 parts by weight in 100 parts by weight of an aqueous medium by irradiation with ionizing radiation at 0–100°C and a pressure of about atmospheric to 50 kg/cm² in the absence of dispersing or emulsifying agents, the irradiation dose rate being greater than 1×10^4 R/hr. and less than that dose rate leading to a violent reaction, and the total dose being in the region of 1×10^3 to 2×10^5 R.

3,941,672

METHOD OF MANUFACTURING LIGHT SENSITIVE HETERODIODE

Yasuo Tanaka, Koganei; Hideaki Yamamoto, Kokubunji; Keiko Ooki, Tachikawa; Naohiro Goto, Machida, and Toru Takigawa, Mobara, all of Japan, assignors to Hitachi, Ltd. and Nippon Hoso Kyokai, both of, Japan

Filed Mar. 11, 1974, Ser. No. 450,186
Claims priority, application Japan, Mar. 12, 1973, 48-28022
Int. Cl.² C23C 15/00
U.S. Cl. 204—192 20 Claims



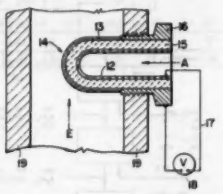
1. A method of manufacturing a light sensitive element comprising forming an n-type transparent conductive layer on a transparent substrate, the surface of said n-type layer defining microprotrusions, and forming a p-type photoconductive layer on the n-type transparent conductive layer to form a rectifying contact therewith, said process characterized in that said n-type transparent layer is subjected to plasma etching to remove at least 100 A of said n-type transparent layer and thereby smooth said microprotrusions before the p-type photoconductive layer is deposited thereon and in that the p-type photoconductive layer is a layer of a material whose main component is a chalcogenide containing selenium.

3,941,673

OXYGEN SENSOR DEVOID OF CATALYTIC OXIDATION ACTIVITY

Hiroshi Takao, Kamakura; Kinmochi Togawa, Zushi; Kazuo Matoba, Yokohama, and Yoshitaka Hata, Fujisawa, all of Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed Aug. 5, 1974, Ser. No. 494,890
Claims priority, application Japan, Aug. 29, 1973, 48-96219
Int. Cl.² G01N 27/30, 27/46
U.S. Cl. 204—195 S 3 Claims



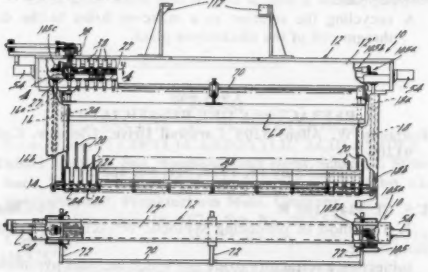
1. In an oxygen sensor having a layer of a solid oxygen-ion electrolyte, a first electrode formed on one side of said layer to communicate with a reference gas and a second electrode formed on the opposite side of said layer to communicate with a gas subject to measurement of oxygen content, the improvement comprising said second electrode being made of a composite material comprising a platinum group metal selected from the group consisting of platinum and rhodium and at least one catalytic poison selected from the group consisting of lead, sulfur, phosphorous, arsenic and their compounds formed by reaction with each other, said catalytic poison amounting to such that said complex material is devoid of catalytic activity with respect to oxidation of carbon monoxide and hydrocarbons in an engine exhaust gas.

3,941,674

PLATING RACK

Richard H. Vanmunster, Attenhoven, Belgium, assignor to Monroe Belgium N.V., Sint-Truiden, Belgium

Filed May 31, 1974, Ser. No. 474,902
Int. Cl.² C25D 17/08, 17/28
U.S. Cl. 204—212 19 Claims



1. A plating rack for use in plating cylindrically contoured surfaces of articles having threaded end portions, said plating rack comprising: a frame comprising generally parallel, vertically spaced upper and lower frame structures; support means on said frame structures, said support means including vertically oriented drive assemblies for supporting said articles on said frame such that said articles are rotatable about parallel vertical axes defined by the cylindrically contoured surface thereof; drive means for simultaneously rotating said articles

in the same direction about their respective axes; and conductor means including means for conducting plating current through each of said drive assemblies to the article connected thereto.

3,941,675

BIPOLAR MULTIPLE ELECTROLYTIC CELL COMPRISING A DIAPHRAGM AND ELECTRODE FOR SAME

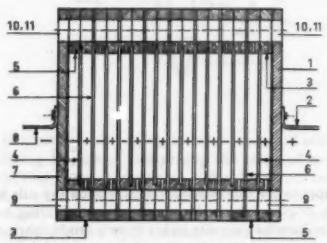
Bernd Strasser, Hamm; Wolfgang Kramer, Herdecke; Luciano Mose, Dortmund, and Helmut Hund, Schneidhain, all of Germany, assignors to Friedrich Uhde GmbH, Dortmund, Germany

Continuation-in-part of Ser. No. 292,328, Sept. 26, 1972, abandoned. This application Mar. 26, 1974, Ser. No. 454,949

Claims priority, application Germany, Sept. 28, 1971, 2148337

Int. Cl.² B01K *1/00, 3/06;* **C01B** *11/26*

U.S. Cl. 204—256 **7 Claims**



1. A bipolar multiple electrolytic cell comprising a diaphragm for decomposing alkali-halogenide solutions, and in which the cells, electrically connected in series, are formed by a continuous series of planar metal electrodes, frames, diaphragms and further metal electrodes, the metal sheet electrodes acting on one side as the anode and on the other as the cathode, and the anode side being of titanium coated with a metal or metal oxides for activation purposes, the improvement comprising a metallic coating closely and completely covering and bonded to that side of said sheet constituting the cathode and applied chemically, said coating comprising an alloy of nickel and elements of group III or V of the periodic system.

3,941,676

ADJUSTABLE ELECTRODE

Elmer Nelson Macken, Stamford, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Dec. 27, 1974, Ser. No. 536,878

Int. Cl.² B01K *3/04;* **C23B** *5/68*

U.S. Cl. 204—266 **17 Claims**

11. The diaphragm cell of claim 9 wherein said rotatable shaft for each said anode is positioned between said anode surfaces near the leading edge of said anode.

12. The diaphragm cell of claim 11 wherein said rotatable shaft for each said anode is a crank shaft.

13. The diaphragm cell of claim 7 wherein a bar having openings equidistantly spaced along said bar and corresponding to the number of said rotatable shafts interconnects said

rotatable shafts of said anodes and maintains said space between said rotatable shafts at a constant distance.

3,941,677

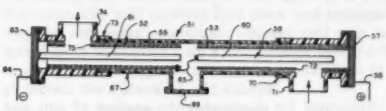
ELECTROLYTIC REGENERATION CELL

Joseph R. Bourne, Dewitt, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed June 27, 1974, Ser. No. 483,721

Int. Cl.² C25B *9/00*

U.S. Cl. 204—272 **1 Claim**



1. Apparatus for electrolyzing electrolytically regeneratable ionic oxidizing agents in a fluent aqueous acid solution to increase the oxidation state of said ions, said apparatus comprising:

an anode comprising an elongated tubular member;

a cathode comprising an elongated cylindrical rod positioned inside the tubular anode, said tubular anode and said cylindrical rod cathode having opposing surfaces, said opposing surfaces being uniform, and concentric about a common axis and defining a passageway therebetween;

means for connecting said anode and said cathode to an electric energy source to impress an electric potential across said anode and said cathode to effect an electric current flow between said opposing surfaces through solution flowing in said passageway;

inlet means for admitting the aqueous acid solution into said passageway adjacent one end of said apparatus;

outlet means for discharging the aqueous acid solution from said passageway adjacent the other end of said apparatus,

the exterior diameter of the rod cathode being smaller than the interior diameter of the tubular anode so that the anode area in contact with the regeneration ionic oxidizing agents in the aqueous acid solution passing through said apparatus is larger than the cathode area in contact therewith, to thereby inhibit the rate at which the valence of the ions at the cathode are reduced and increase the production of ions in a high oxidation state in the aqueous acid solution leaving the apparatus,

said anode tubular member comprising a plurality of axially aligned tubular anode portions having ends substantially open to one another for free flow of said aqueous acid solution through said apparatus from one anode portion to the next anode portion, said cathode cylindrical rod comprising a plurality of axially aligned cylindrical rod cathode portions, each said cylindrical rod cathode por-

tion being positioned inside one of said tubular anode portions to form an anode-cathode pair having opposing surfaces, and said apparatus further comprising means for electrically connecting said anode-cathode pairs in series to decrease effective current required by said apparatus.

3,941,678

APPARATUS FOR ELECTROPHORETIC ANALYSIS

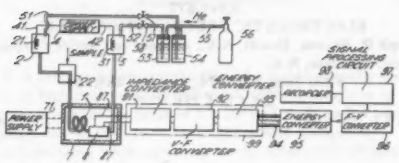
Junichi Akiyama, Kyoto, Japan, assignor to Shimadzu Seisakusho Ltd., Kyoto, Japan

Filed Feb. 20, 1975, Ser. No. 551,275

Claims priority, application Japan, Feb. 28, 1974, 49-23802; Mar. 7, 1974, 49-26961

Int. Cl.² B01K 5/00

U.S. Cl. 204—299 R 7 Claims



1. Apparatus for electrophoretic analysis of ions and like electrically charged particles comprising: a capillary tube; means for providing within said tube a liquid column containing different kinds of ions; means for providing a potential difference between the opposite ends of said liquid column to separate said ions into different zones; means for detecting the potential gradients of said ions in said separated zones; and operation circuit means for calculating the ratio between the potential gradient of one of said different kinds of ions and that of each of the other kinds of ions.

3,941,679

SEPARATION OF HYDROCARBONACEOUS SUBSTANCES FROM MINERAL SOLIDS

Clay D. Smith, and D. V. Keller, Jr., both of Lafayette, N.Y., assignors to OTISCA Industries Ltd., Lafayette, N.Y.

Filed Apr. 12, 1974, Ser. No. 460,558

Int. Cl.² C10G 1/04

U.S. Cl. 208—11 LE 7 Claims

1. A process of separating a hydrocarbonaceous substance from mineral solids with which said hydrocarbonaceous substance is mixed, said method comprising the steps of: forming a fluid phase containing the hydrocarbon substance by contacting the composite containing said substance with a non-aqueous extraction solvent which contains trichlorofluoromethane and is capable of separating said hydrocarbonaceous substance from the mineral solids with which it is mixed in the composite, the extraction solvent being chemically non-reactive with the hydrocarbonaceous substance under the process conditions and having a boiling point below the boiling point of water and the step being carried out under conditions such that the solvent remains essentially in the liquid state; separating said fluid phase from the mineral solids without the introduction of an aqueous fluid into the process; and stripping the extraction solvent from the fluid phase to isolate the hydrocarbonaceous substance.

3,941,680

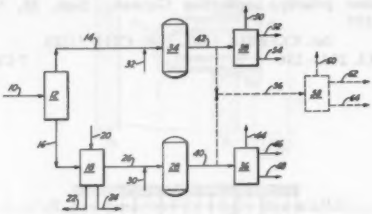
LUBE OIL HYDROTREATING PROCESS

Millard C. Bryson, Conway; Harry C. Murphy, Jr., Apollo, both of Pa.; James R. Murphy, Houston, Tex., and Harry C. Stauffer, Cheswick, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Oct. 20, 1971, Ser. No. 190,961

Int. Cl.² C10G 41/00, 13/08, 37/02

U.S. Cl. 208—80 3 Claims



1. A process for the production of lubricating oils in order to obtain comparatively low viscosity lubricating oil base stocks of enhanced viscosity index from a crude lubricating oil which process comprises fractionating a crude lubricating oil containing from about 10% to about 90% by volume of a distillate fraction boiling below 950° F. and from 90% to 10% of a residual fraction boiling above 950° F. into a residual and a distillate fraction, subjecting the residual fraction to hydrotreating wherein the operating conditions employed comprise a temperature in the range from about 650° F. to about 850° F., a pressure in the range from about 2,000 to about 10,000 psig, a liquid hourly space velocity in the range from about 0.1 to about 10 volumes of residual charge stock per volume of catalyst per hour and a hydrogen feed rate in the range from about 2,000 to about 10,000 standard cubic feet per barrel of residual charge stock, said operating conditions being selected so as to maintain a yield of at least 50% by volume based upon the residual fraction of hydrotreated material boiling above about 625° F., separately subjecting the distillate fraction to hydrotreating under more severe conditions than employed in hydrotreating the residual fraction wherein the operating conditions employed comprise a temperature in the range from about 700° to about 900° F. and at least 15° F. greater than the temperature employed in hydrotreating the residual fraction when the remaining hydrotreating process parameters are substantially the same as like hydrotreating process parameters for the residual fraction, a pressure in the range from about 2,000 to about 10,000 psig, a liquid hourly space velocity in the range from about 0.1 to about 10 volumes of distillate charge stock per volume of catalyst per hour and a hydrogen feed rate in the range from about 2,000 to about 10,000 standard cubic feet per barrel of distillate charge stock, said operating conditions being selected so as to maintain a yield of at least 50% by volume based upon the distillate fraction of hydrotreated material boiling above about 625° F., and recovering hydrotreated crude lubricating oil boiling above about 625° F. as lubricating oil base stock product from each hydrotreating process.

3,941,681

PROCESS FOR CONVERTING INFERIOR HEAVY OIL INTO LIGHT OIL AND GASIFYING THE SAME

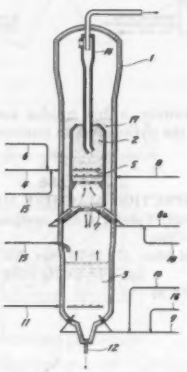
Hitoshi Saegusa, Osaka, and Masami Yoshitake, Sakai, both of Japan, assignors to Mitsui Shipbuilding and Engineering Co., Ltd., Tokyo, Japan

Filed Dec. 11, 1974, Ser. No. 531,600

Claims priority, application Japan, Dec. 17, 1973, 48-141641

Int. Cl.[2] C10G 37/06; B01J 8/22

U.S. Cl. 208—107 2 Claims



1. A process for converting inferior heavy oil into light oil and gasifying the same, comprising the steps of providing a hydrocracking zone comprising coke fluidized bed and a gasification zone comprising a molten alkali salt, feeding said inferior heavy oil into said hydrocracking zone, introducing produced gas into said hydrocracking zone to hydrocrack said raw inferior heavy oil in a high-hydrogen atmosphere, feeding the by-produced coke in said gasification zone together with a part of the circulating hydrogen and steam, feeding a part of said raw inferior heavy oil into said gasification none, to gasify the same with oxygen and steam in the molten salt, and feeding obtained high temperature gas into the hydrocracking zone for obtaining the fluidizing gas and sensible heat thereof.

3,941,682

REGENERATION PROCEDURE

Walter S. Kmak, Scotch Plains, and David J. C. Yates, Westfield, both of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Aug. 16, 1973, Ser. No. 388,742

Int. Cl.[2] C10G 35/08; B01J 23/96

U.S. Cl. 208—140 21 Claims

9. In a process for the catalytic reforming of a naphtha feed stock wherein said naphtha feed stock and hydrogen are contacted with a catalyst comprising from about 0.01 to about 3.0 wt. % of an iridium component and a halogen component contained on an alumina support at naphtha reforming conditions, the catalyst having been at least partially deactivated during contact with said naphtha feed stock by the deposition of carbonaceous residues, a method for regenerating said catalyst after discontinuing contact of said catalyst with said feed stock comprising;

1. contacting said catalyst in a reaction zone with a gaseous mixture containing oxygen at an elevated temperature for a time sufficient to burn a substantial portion of said carbonaceous residues from said catalyst, the duration of said contacting at said elevated temperature being insufficient to convert more than about 70 wt. % of the iridium on said catalyst to agglomerates having crystallite sizes greater than about 50A;
2. contacting said carbonaceous residue-depleted catalyst in said reaction zone with a gas mixture containing hydrogen at a temperature varying from about 650°–950°F. for a time sufficient to convert a substantial portion of said iridium to its metallic form, wherein said step (2) is effected prior to contact with a substantially halogen-free, oxygen-containing gas at a temperature sufficient to agglomerate further the iridium on said catalyst;
3. contacting said treated catalyst having a substantial portion of the iridium contained thereon in the metallic form in said reaction zone with a gas mixture containing chlorine at a temperature of greater than about 850° F., said gas mixture being introduced into said reaction zone at a rate such that the chlorine concentration of the treating gas at the outlet of said reaction zone is at least 50% of the inlet chlorine concentration within at least 15 minutes from the time of the introduction of said treating gas into the inlet of said reaction zone;
4. contacting said chlorine treated catalyst in a reaction zone with a gas mixture containing hydrogen at a temperature varying from about 650° to 950° F. for a time sufficient to convert a substantial portion of said iridium to its metallic form;
5. contacting said treated catalyst having a substantial portion of the iridium contained thereon in the metallic form in said reaction zone with a gas mixture containing chlorine at a temperature greater than about 850° F. for a time sufficient to redisperse at least a portion of the iridium on the catalyst; and
6. contacting said treated catalyst from step (5) in a reaction zone with said naphtha feed stock and hydrogen at naphtha reforming conditions, wherein said step is effected prior to contact with a substantially halogen-free, oxygen-containing gas at a temperature sufficient to agglomerate the iridium on said catalyst.

3,941,683

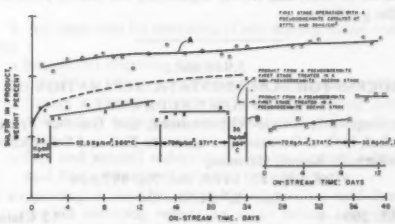
TWO STAGE METAL-CONTAINING OIL HYDRODESULFURIZATION PROCESS EMPLOYING AN ACTIVATED ALUMINA CATALYST IN THE SECOND STAGE

Harold Beuther, Gibsonia; Sun W. Chun, Murrysville, and Angelo A. Montagna, Monroeville, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Apr. 24, 1974, Ser. No. 463,619

Int. Cl.[2] C10G 23/02

U.S. Cl. 208—210 11 Claims



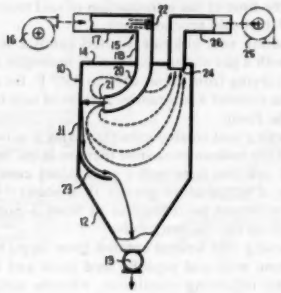
1. A process of hydrodesulfurizing a metalcontaining hydrocarbon feed oil at a temperature between 600° and 1,000°F., and a hydrogen pressure between 50 and 5,000 psi comprising passing said feed oil and hydrogen through first and second hydrodesulfurization zones in series with interzone removal of gaseous by-products, the catalyst in said second zone comprising Group VI-B and Group VIII metals supported on a first alumina said first alumina being prepared by drying and calcining a crystalline alumina hydrate having 1.2 to 2.6 mols of water of hydration per mol of alumina, the catalyst in said first zone comprising Group VI-B and Group VIII metals supported on a second alumina, said second alumina being pre-

pared by drying and calcining an alumina hydrate selected from the group consisting of alumina monohydrate and alumina trihydrate, and maintaining the temperature in said second zone higher than the temperature in said first zone.

3,941,684
SCRAP SALVAGE SYSTEM

Christopher Grover Bradbury, Rumford, R.I.; Stanley Thomas Gotham, Somerset, Mass., and Joseph Paul Wudyka, Cumberland, R.I., assignors to Leesona Corporation, Warwick, R.I.

Filed Mar. 11, 1974, Ser. No. 449,600
Int. Cl.² B03B 1/00
U.S. Cl. 209—3 **22 Claims**



15. A process for salvaging the materials of composite metallic and plastic members to yield fiber/dust and heavier particles of metal, and plastic comprising the steps of granulating the members, entraining the fiber/dust and particles in a stream of air to flow the same into an enclosure while controlling the air flow pattern under a suction induced air current as the fiber/dust and particles enter the enclosure to effect impingement of the particles against an upright wall substantially normal thereto thereby reducing the momentum of the particles with the particles falling downwardly under the influence of gravity while the fiber/dust is substantially precluded from impingement against the upright wall, removing the fiber/dust in said air stream, and finally separating the plastic from the metallic particles.

3,941,685
PROCESS FOR ELECTROSTATIC SEPARATION OF PYRITE FROM CRUDE COAL

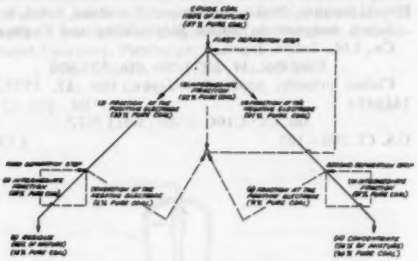
Arno Singewald, Kassel-Wilhelmshohe, and Gunther Fricke, Neuhof, both of Germany, assignors to Kali und Salz Aktiengesellschaft, Kassel, Germany

Filed Aug. 15, 1974, Ser. No. 497,636
Int. Cl.² B03B 1/04
U.S. Cl. 209—9 **12 Claims**

1. A process for electrostatic separation of particles of pyrite from powdered crude coal in a mixture thereof at a temperature between room temperature and 100°C, by contact electrification of said particles, comprising

a. vigorously mixing said particles with a conditioning substance comprising glycerides of high and middle saturated and unsaturated fatty acids for a period of between 10 seconds and 30 minutes and in quantities of about 100–2000 grams per ton of powdered crude coal, thereby to form conditioned electrified particles thereof in said field, and

b. separating said conditioned electrified particles in an electric field produced by a free falling plate type separator according to their charge at a relative humidity of about 2.5–20% whereby there is obtained a first purified

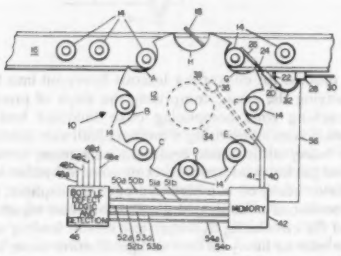


coal concentrate, a first residue containing the greater portion of the pyrite, and an intermediate fraction.

3,941,686
INSPECTION MACHINE MEMORY

John W. Juvinall, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Mar. 27, 1975, Ser. No. 562,989
Int. Cl.² B07C 5/00
U.S. Cl. 209—74 M **6 Claims**



1. In an inspection machine for glass containers wherein glass containers are removed one at a time from a continually moving conveyor, wherein said glass containers are serially indexed through a plurality of inspection stations and wherein said inspection machine includes a bottle defect logic and detection means, having a plurality of output conductors, for generating signals on said output conductors if said inspected glass containers are determined to be defective in one or more aspects at any one of said inspection stations, an improved memory system for said inspection machine which comprises, in combination:

a plurality of master-slave type flip-flops, connected in series, said plurality of flip-flops being one more in number than the number of said inspection stations;

means for connecting an output conductor from said logic means to each one of said flip-flops except the last one of said plurality of flip-flops;

timing means for presenting a first electrical state when said inspection machine is inspecting and a second electrical state when said inspection machine is in its index cycle;

electronic clock circuit means, connected to said timing means and each of said flip-flops, for generating a clock pulse, having a rise time faster than the information transfer time through said flip-flops, in response to the transition of said timing means from said second electrical state to said first electrical state; and

electronic output circuit means, connected to said clock circuit means and the output of the last one of said flip-flops, for generating a signal when said last flip-flop

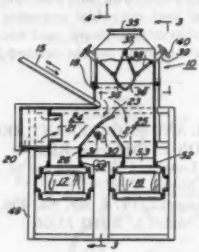
carries a signal indicating the presence of a defective glass container and when said clock pulse is present.

3,941,687

SOLIDS SEPARATION

Lawrence Gordon Peterson, Haddon Township, N.J., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Sept. 26, 1974, Ser. No. 509,384
Int. Cl.² B07B 4/02
U.S. Cl. 209—136 4 Claims



1. A solids separation system for assorting pieces of a mixture fragmented of metal scrap including non-metallic solid contaminants into respective light and heavy metallic fractions, said system comprising:

An enclosed separation vessel having forward and rear walls, means for feeding a mixture of discrete pieces of fragmented metal scrap solids to an inlet of said vessel at said forward wall, for free fall into the vessel, means at said solids inlet to restrict escape of gas from said vessel, means below disposed normal to and laterally apart from said free fall path of said solids fed through said solids inlet for horizontally directing a stream of air into an air inlet of said vessel for flow across said vessel; a heavy-solids receiving chamber at said air inlet into which chamber the air is initially admitted, a light-solids receiving chamber downstream of said air inlet, said heavy-solids receiving chamber having an angularly disposed wall sloping upwardly towards said light-solids chamber, said wall being adjustable to vary its slope, the upper edge of said wall being spaced from said solids inlet to provide an adjustable flow path, by varying the slope of said wall and thus the space between said upper edge and said solids inlet for adjusting gas flow from said heavy-solids chamber into said light-solids chamber, an air discharge port at the upper end of said vessel, whereby the air admitted from said heavy solids chamber into said light solids chamber is induced to flow upwardly toward said discharge port, adjustable first air deflector means below said air discharge port and in the path of the upwardly flowing gas at the forward wall side of the vessel and separately adjustable second air deflector means in the path of the upwardly flowing gas at the rear wall of said vessel, said first and second air deflectors so constructed and arranged to adjust the transverse size of the air flow path formed between each of said air deflectors and the vessel wall adjacent thereto.

3,941,688

METHOD FOR SEPARATION OF MIXTURE OF POLYESTER AND CELLULOSE DERIVATIVE

Kozo Saitoh, Tokyo, and Sumio Izumi, Kobubunji, both of Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Tokyo, Japan

Filed May 14, 1974, Ser. No. 469,723
Claims priority, application Japan, Dec. 8, 1973, 48-138254; Dec. 8, 1973, 48-138255
Int. Cl.² B03D 1/02
U.S. Cl. 209—166 9 Claims

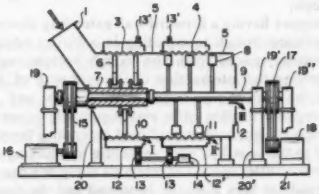
1. A method for the separation of a mixture of a polyester and a cellulose derivative selected from the group consisting of cellulose diacetate, cellulose triacetate and nitrocellulose comprising introducing gas bubbles into a dispersion of a mixture of said polyester and said cellulose derivative, said polyester and said cellulose derivative being solid pieces having a size of 1 to 50 mm, in an aqueous liquid medium in the presence of at least one wetting agent to render the surfaces of the polyester pieces more hydrophilic than the surfaces of the cellulose derivative pieces and at least one flotation agent, whereby said cellulose derivative is floated thereby separating said mixture into said polyester and said cellulose derivative.

3,941,689

APPARATUS FOR SORTING WASTE FOR DISPOSAL

Yoshio Hirayama, Kamakura, and Kanichi Ito, Yokohama, both of Japan, assignors to Ebara Manufacturing Co., Ltd., Tokyo, Japan

Filed Aug. 14, 1974, Ser. No. 497,275
Claims priority, application Japan, Aug. 27, 1973, 48-95948
Int. Cl.² B07B 1/24
U.S. Cl. 209—296 5 Claims



1. An apparatus for disposing of and sorting waste, comprising:

a hopper for receiving waste;

a cylindrical drum communicating with said hopper and having a discharge opening, said drum being provided with a first screen and a second screen axially disposed; and

a first and second reducing means in opposed relation to said first and second screens, respectively;

supporting means for rotatably supporting said first and second reducing means so as to rotate said reducing means within said drum, a first portion of said supporting means supporting said first reducing means being coaxial with a second portion of said supporting means supporting said second reducing means,

driving means for driving said first and second reducing means at an independent rotational speed, respectively through said supporting means;

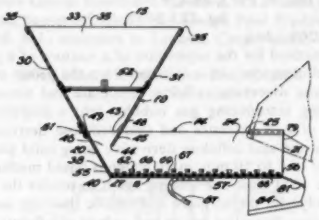
a first outer cylinder and a second outer cylinder disposed around said first and second screens, respectively, said first and second outer cylinders being provided witha discharge opening, respectively, so as to discharge the sorted waste received therein which has passed through the corresponding screen.

3,941,690

PORTABLE SLUICE PAN

Michael D. Powers, and William J. Piton, both of Spokane, Wash., assignors to William J. Piton, Spokane, Wash.

Filed Nov. 29, 1974, Ser. No. 528,429
Int. Cl.² B03B 5/26
U.S. Cl. 209—443 8 Claims



1. A portable sluice pan for concentrating gold-bearing placer material comprising:

an elongated channel sluice trough having a head end and an open overflow end, said trough having a U-shaped cross section with a bottom wall and opposing side walls extending from the head end to the overflow end;

a mixing hopper having an exit opening communicating with the trough adjacent the head end for receiving the placer material and water and for mixing the placer material and water to form a sluice pulp and for directing the pulp into the trough at the head end;

said hopper having inclined walls with a rear wall extending downward into the sluice trough terminating at the bottom wall of the sluice trough intersecting the bottom wall at a predetermined longitudinal location of the sluice trough;

said hopper having a forward wall extending downward into the sluice trough terminating in a throat edge which is vertically spaced from the trough bottom wall directly overlying the intersection of the rear wall of the hopper and the bottom wall of the sluice trough; and

an elongated flexible riffle mat removably mounted in the trough on the bottom wall and extending from the head end to the overflow end; said riffle mat having a plurality of cross riffles spaced at intervals along the mat to permit the pulp to flow from the head end and the overflow end while causing the pulp to flow in a turbulent manner over the riffles to separate the heavier gold-bearing particles from lighter particles.

3,941,691

METHOD OF BIOLOGICAL PURIFICATION OF INDUSTRIAL EFFLUENTS FROM CHROMATES AND BICHROMATES

Vitaly Ivanovich Romanenko, Nekouzsky raion, p/o Borok, 36, kv. 21, Yaroslavskaya oblast; Sergei Ivanovich Kuznetsov, Volkhovsky pereulok, 21, kv. 1, and Vladimir Nikolaevich Korenkov, Samarkandsky bulvar, 32, korpus 1, kv. 51, both of Moscow, all of U.S.S.R.

Filed Oct. 4, 1974, Ser. No. 512,328
Claims priority, application U.S.S.R., Nov. 20, 1973, 1971152
Int. Cl.² C02B 5/10
U.S. Cl. 210—2 2 Claims

1. A method of biological purification of industrial effluents from chromates and bichromates which comprises mixing industrial effluents containing chromates and bichromates with domestic sewage waters, contacting the thus obtained mixture of waste waters with a culture of *Bacterium decromaticans* Romanenko B-1167 microorganism and maintaining the resulting mixture under anaerobic conditions until substantially complete reduction of the chromates and bichromates to chromium hydroxide, and separating said culture from the purified water.

3,941,692

CLEANING OF CARGO COMPARTMENTS

David Gutnick, 60 Tagore St., Tel Aviv, and Eugene Rosenberg, 9 Habrosh St., Raanana, both of Israel

Continuation of Ser. No. 364,048, May 25, 1973, abandoned. This application Jan. 10, 1975, Ser. No. 540,176
Claims priority, application Israel, Apr. 3, 1973, 41941
Int. Cl.² C02B 9/02
U.S. Cl. 210—11 6 Claims

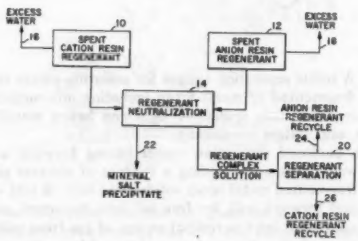
1. A process for removing oil from sea water in ship compartments which comprises adding to oil-containing sea water in a ship compartment a microbial organism, a source of nitrogen and a source of phosphorus and converting the resultant mixture to a non-oily form with said microbial organism or the products of said microbial organism under aerobic conditions in said ship compartment, said microbial organism being the microbial organism herein defined at RAG-1.

3,941,693

SOLID MINERAL AND REGENERANT RECOVERY FOR ION-EXCHANGE RESINS

David O. DePree, Loomis, Calif., assignor to Aerojet-General Corporation, El Monte, Calif.

Filed Aug. 12, 1974, Ser. No. 496,619
Int. Cl.² B01D 15/06
U.S. Cl. 210—34 23 Claims



1. A method of recovering and recycling spent ion-exchange regenerants comprising the steps of:

1. passing through a first, separate bed of spent, weakly-basic, anion exchange resin containing bound inorganic anion, X, a weak organic base anion regenerant, R_a, to regenerate said resin and to form a first effluent stream containing spent anion regenerant of the formula, R_aX;

2. passing through a second, separate bed of spent, weakly acidic cation exchange resin containing bound inorganic cation, M, a cation regenerant, R_c, selected from organic complexing agents for the inorganic cation, M, and weakly acidic organic carboxylic acids to regenerate said resin and to form a second effluent stream containing spent cation regenerant of the formula, MR_c;

3. combining said first stream containing spent anion regenerant, R_aX, with said second stream containing spent cation regenerant, MR_c, to form a mixture containing a strongly dissociated, ionizable complex, R_cR_a, and reconstituted inorganic salt, MX;

4. dissociating the complex to free R_c or R_a regenerant;

5. separating one of the regenerants from the mixture and recycling it to one of said beds; and

6. separating the remaining regenerant from the mixture and recycling it to the other of said beds.

3,941,694

PROCESS FOR REDUCING THE ADHERENCE OF OIL TO SILICEOUS MATERIAL

Paul R. Scott, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 15,952, March 2, 1970, abandoned. This application Apr. 20, 1971, Ser. No. 135,760
Int. Cl.[2] C02B 9/02
U.S. Cl. 210—40 11 Claims

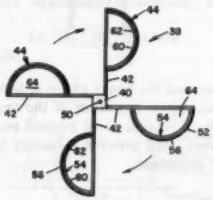
1. A method for reducing the adherence of oil to siliceous material comprising contacting the material with a blend of a primary long chain aliphatic alcohol having from 10 to 20 carbon atoms with a polar-containing aliphatic solvent.

3,941,695

ZERO ENERGY INPUT FLOCCULATOR

W. Leslie Harris, 1438 Yosemite Circle, Concord, Calif. 94521

Filed Dec. 26, 1973, Ser. No. 427,771
Int. Cl.[2] C02B 1/20
U.S. Cl. 210—49 19 Claims



1. In a method for processing raw water into potable water which includes the steps of forming a mixture by adding to the raw water a coagulating chemical, mixing the raw water with the chemical, forming flocs defined by a plurality of individual coagulated particles in a sedimentation basin holding the mixture, and separating the floc from the raw water by permitting the floc to settle in the basin, the improvement comprising the step of mechanically enhancing the formation of flocs by flowing the mixture through the basin in a downstream direction, placing a flocculator wheel in the mixture flow, the wheel having a plurality of cup-shaped, interconnected plate means, submerging the plate means in the mixture flow, and rotating the wheel about its axis by employing the mixture flow in the basin as the sole source of motive power for the wheel.

5. In a water works sedimentation basin through which raw water treated with a coagulant flows at a relatively constant speed a flocculator comprising a wheel defined by a hub, a plurality of paddles submerged in this water disposed about and connected to the hub, each paddle comprising a curved sheet member having an elongate configuration and defining a trough, the troughs of all paddles facing in the same direction of rotation of the hub, the troughs extending over substantially the full width of the basin, and means rotatably mounting the wheel and positioning it within the basin so that the water flow therein rotates the wheel, whereby the water flow in the basin is diverted over relatively moving surfaces to enhance the coagulation process without the need for an external power supply to rotate the wheel.

3,941,696

STERILIZATION OF HOLDING TANKS AND TOILET BOWLS BY QUATERNARY COMPOUNDS

Joseph L. Melnick, and Craig Wallis, both of Houston, Tex., assignors to Baylor College of Medicine, Houston, Tex.

Continuation of Ser. No. 426,793, Dec. 20, 1973, abandoned. This application Mar. 24, 1975, Ser. No. 561,447
Int. Cl.[2] C02B 3/06
U.S. Cl. 210—62 20 Claims

1. A method of sterilizing wastewater in tanks and the like, the wastewater having an organic load containing bacteria not inactivated by basicity alone and viruses comprising,

adding 10 to 400 ppm liquid quaternary compound containing a pyridinium moiety to the wastewater for 1000 ppm suspended solids in the wastewater, and

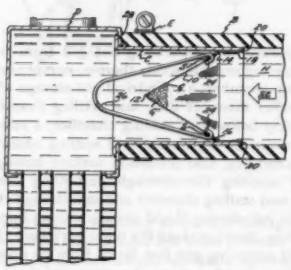
adding a liquid base to the wastewater to interact with said quaternary compound to cause said quaternary compound to inactivate said bacteria and viruses and in an amount sufficient to bring the wastewater to a pH of about 10.5.

3,941,697

AUTOMOTIVE COOLING SYSTEM FILTER ASSEMBLY

Louis B. Johnson, 309 Boxwood Road, Oceanside, Calif. 92054

Filed Dec. 30, 1974, Ser. No. 537,456
Int. Cl.[2] B01D 29/04
U.S. Cl. 210—167 1 Claim



1. In combination with an automotive radiator having a liquid inlet tube extending rearwardly therefrom to which a resilient hose is connected, a filter assembly of the type that includes a conical filter screen having a base portion said filter assembly being characterized by including:

a. a cylindrical rigid member that is snuggly and slidably insertable within said tube, said member having first and second ends;

b. a forwardly and inwardly extending rigid flange that is an integral part of said member and extends forwardly from said first end thereof;

c. a circumferentially extending lip that projects outwardly from said second end of said member and acts as a stop to prevent said member being moved forwardly beyond a predetermined position in said tube;

d. a V-shaped wire handle that may be longitudinally disposed in said tube, said handle of such size as to extend around said screen, and said handle having two laterally spaced first ends;

e. first means for securing said base portion of said screen to said flange; and

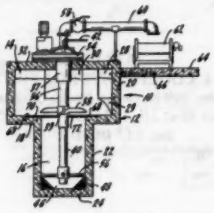
f. second means for pivotally securing said first ends of said handle to said flange, said flange and handle cooperating to permit a longitudinal force to be exerted on said filter assembly to withdraw the same from said hose without any strain being placed on said screen during such withdrawal, with said screen when cooling liquid is discharged through said tube collecting foreign particles of solid material entrained with said liquid on the interior surface of said screen, and said collected solid particles due to the velocity of said liquid tending to move forwardly in said screen to accumulate as a compact body in the apex portion thereof where said particles define a minimum of resistance to the flow of said cooling liquid through said tube, with said cylindrical rigid member serving as dual support for said lip and said flange screen and handle.

3,941,698

GRIT SELECTOR

Frank G. Weis, Kansas City, Mo., assignor to Ecodyne Corporation, Lincolnshire, Ill.

Continuation of Ser. No. 443,667, Feb. 19, 1974, abandoned.
This application May 8, 1975, Ser. No. 575,853
Int. Cl.² B01D 21/26
U.S. Cl. 210—208 10 Claims



1. Apparatus for separating out grit from liquid sewage while retaining organic solids therein, comprising: a cylindrical settling chamber; a cylindrical grit storage chamber, having a smaller diameter than said settling chamber, disposed immediately below said settling chamber; a substantially flat transition surface separating said settling chamber and said storage chamber, said transition surface having a centrally disposed opening therethrough permitting communication between said settling chamber and said storage chamber; inlet means for introducing liquid sewage into an upper portion of said settling chamber along the outer periphery thereof, outlet means for removing grit free liquid from an upper portion of said settling chamber along the outer periphery thereof, said outlet means being spaced from said inlet means by a distance equal to a substantial portion of the circumference of said settling chamber in the direction of liquid flow; said liquid flow having a flow velocity in the laminar range; and paddle means mounted within said settling chamber for rotation about a substantially verticla axis, said paddle means being positioned a short distance above said transition surface opening and rotated at a sufficient rate for causing the liquid within said settling chamber to rotate as a forced vortex resulting in an upward spiral flow which urges the settled particles across said transition surface toward said opening and causes said grit to fall through said opening into said storage chamber and said organic particles to rise in said spiral flow.

3,941,699

PLASMA SEPARATOR WITH CENTRIFUGAL VALVE

Waldemar A. Ayres, Rutherford, N.J., assignor to Becton, Dickinson and Company, East Rutherford, N.J.

Filed Feb. 27, 1974, Ser. No. 446,366
Int. Cl. B01d 21/26
U.S. Cl. 210—117 5 Claims

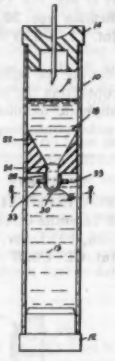
1. A separator device for separating mixed light phase and heavy phase constituents of blood and establishing a permanent barrier between said phases, including:

a tubular container sealed at both ends and adapted to contain the blood to be separated;

elastomeric barrier means fixedly located intermediate the container ends and dividing the container into first and second chambers which upon the application of centrifugal force are adapted to contain in major proportions the light phase and heavy phase, respectively;

a passageway through the barrier means connecting the first and second chambers; and

a bulb extending over and closing the passageway, the bulb having a normally closed slit, and thrust generating means attached to said bulb and responsive to centrifugal force to open the slit, the bulb normally sealing off the passageway to provide a barrier between first and second chambers, and when subjected to a predetermined centrifugal force, the thrust generating means flexes open the slit to open the passageway to provide communication between the chambers to permit the light phase to travel to the



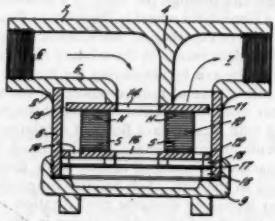
first chamber and the heavy phase to travel to the second chamber, and upon cessation of the applied centrifugal force, the bulb returns to its normal position to seal off the passageway and provide a barrier between the first and second chambers.

3,941,700

APPARATUS FOR MAGNETIC TREATMENT OF A FLOWING LIQUID

Eilert Sundt, Sandefjord, Norway, assignor to Olaf Fjeldsend A/S, Haugesund, Norway

Filed July 9, 1974, Ser. No. 486,848
Claims priority, application Norway, July 10, 1973, 2827/73
Int. Cl.² B01D 35/06
U.S. Cl. 210—223 7 Claims



1. Apparatus for the magnetic treatment of a flowing fluid, comprising:

a flow-through housing including an inlet, a removable dependent cup-shaped part defining a chamber in fluid communication therewith, and an outlet in fluid communication with said chamber;

at least one annular cylindrically shaped magnet axially arranged within said cup-shaped part and with its lower end spaced above the bottom thereof;

a ferromagnetic tubular-shaped member inserted within said cup-shaped part along the walls thereof;

a first disc-shaped magnetic pole piece with a central opening therethrough arranged with its peripheral edge spaced away from said tubular member and with its central opening arranged to direct fluid axially and interiorly of said annular magnet;

a second disc-shaped magnetic pole piece with a central opening and located within said cup-shaped part above

the bottom thereof and the peripheral edge of said pole piece in magnetic connection with the walls of said cup-shaped part; and

apertures located in said second pole piece adjacent the walls of said tubular member whereby fluid is conducted from said inlet to the interior of said cylindrical magnet through the central opening of said first pole piece to the space defined above the bottom of the cup-shaped part by the location of the lower end of said magnet thereabove and upwardly therefrom through said second pole piece apertures past the peripheral edge of said first pole piece to the outlet in said housing.

3,941,701
APPARATUS FOR CONTINUOUS DEWATERING OF AQUEOUS SUSPENSIONS

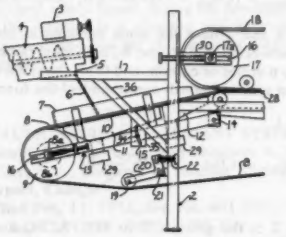
Ulrich Stahl, Tutzing; Oswald Busse, Aarbergen; Hugo Klesper, Aarbergen, and Werner Junker, Aarbergen, all of Germany, assignors to Passavant-Werke Michelbacher Huette, Germany

Filed Aug. 29, 1974, Ser. No. 501,649

Claims priority, application Germany, Oct. 15, 1973, 7338316[U]

Int. Cl.² B01D *33/04*

U.S. Cl. 210—386 **4 Claims**



1. Apparatus for continuously dewatering an aqueous suspension comprising:

a. an endless filter belt supported for movement with its upper flight passing through a feeding and initial partial dewatering zone and then through a main dewatering zone,

b. means supplying an aqueous suspension to said upper flight as it passes through said feeding and initial partial dewatering zone,

c. a backing sheet engaging the under surface of said upper flight while said upper flight is passing relative thereto through said feeding and initial partial dewatering zone and prior to passing through said main dewatering zone,

d. there being drainage slots in the upper surface of said backing sheet extending at an angle to the direction of travel of said upper flight and spaced from each other to leave narrow strips between adjacent slots which support said upper flight as it passes through said feeding and initial partial dewatering zone,

e. means subjecting said upper flight to pressure in a direction to force liquid downwardly therethrough while said upper flight is passing through said main dewatering zone,

f. a head roll receiving the end of said filter belt adjacent said feeding and initial partial dewatering zone and operatively connected to said backing sheet and movable therewith, and

g. means operatively connected to said head roll to retain said head roll at selected elevations so that said filter belt and backing sheet are movable to selected inclinations within said feeding and initial partial dewatering zone.

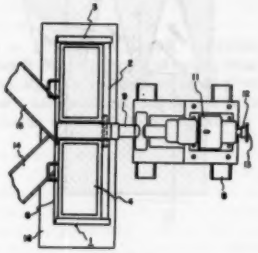
3,941,702
ROTARY STRAINER

Mitsuo Kawada, Toyota, Japan, assignor to Kito Machine Industries Company Limited, Japan

Filed Nov. 14, 1974, Ser. No. 523,818

Int. Cl.² B01D *35/16*

U.S. Cl. 210—391 **3 Claims**



1. A rotary strainer comprising a box-like casing having a plurality of angularly related sides and a like plurality of filters mounted on the sides, a first closed rear plate perpendicularly connected to the sides, and a front plate perpendicularly joined to the sides parallel to the rear plate, the front plate having a central opening, and the rear plate being secured to and rotated by a horizontally driving shaft, a like plurality of partition plates provided in said casing and secured to the sides and the front and rear plates and extending between the plates and from intersections of adjacent filters radially inward in the casing to the opening in the front plate, the plates having inner edges extending rearward from the opening, and the plates thereby extending toward the center of said casing from said respective filters, supply means extending from outside of the casing centrally through the opening into the casing and terminating above a filter in a lower most position for supplying a mixture liquid containing alien substances such as sludge into said casing, and onto the filters and discharge means extending from outside the casing through a lateral position of the opening and rearward beneath inner edges of the partition plates, for receiving alien substance from inner edges of rising partition plates and discharging said alien substances out of said casing.

3,941,703
WIRE SCREENS

Edouard Binard, Brussel, Belgium, assignor to N. V. Bekaert S.A., Zwevegem, Belgium

Filed Dec. 2, 1974, Ser. No. 528,639

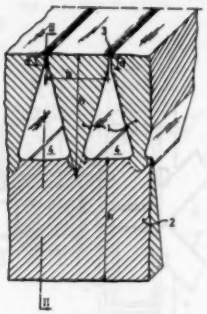
Claims priority, application United Kingdom, Dec. 12, 1973, 57430/73

Int. Cl.² B01D *39/10*

U.S. Cl. 210—499 **28 Claims**

1. A wire screen having substantially parallel screening wires separated by slots of a desired average slot width less than 25 microns, said screen produced by compressing, along the longitudinal axes of the supporting wires, a wire screen comprising substantially parallel screen wires supported by supporting wires and wherein the screening wires are separated by slots having an average slot width greater than de-

sired, the compression effecting plastic deformation of the supporting wires to narrow the slot width of the screening



wires to thereby form the said wire screen having the desired average slot width.

3,941,704

LIQUID CONDITIONING AND SETTLING TANKS

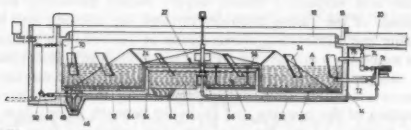
Richard Pierpont Moore, P.O. Box 471, Germiston, Transvaal, South Africa

Filed May 7, 1974, Ser. No. 467,839

Claims priority, application South Africa, May 11, 1973, 73/3195

Int. Cl.² B01D *21/00*

U.S. Cl. 210—528 **15 Claims**



1. A liquid conditioning and settling tank including a substantially flat base, a wall surrounding the base, means partitioning the lower portion only of the tank into first and second compartments, means for feeding liquid to be treated into the first compartment, velocity reducing take off means for removing treated liquid at or near the upper surface of the liquid, from the upper potion of the tank above the partition means, means for maintaining a sludge blanket in the first compartment, a first sludge outlet in or near the base of the first compartment, means for inducing sludge particles which have settled on the base of the first compartment to move to the first outlet, an overflow sill at an upper end of the partition means over which to transfer sludge particles from the surface of the sludge blanket into the second compartment, the second compartment defining a substantially quiescent zone in the tank, means for concentrating sludge particles in the second compartment and means for discharging concentrated sludge from the second compartment.

3,941,705

FIRE EXTINGUISHING COMPOSITIONS CONTAINING FLUORINATED SURFACTANTS

Louis Foulletier, Oullins, and Rene Bertocchio, St. Genis-Laval, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

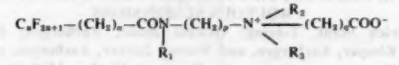
Continuation of Ser. No. 361,135, May 17, 1973, abandoned. This application Mar. 18, 1975, Ser. No. 559,565

Claims priority, application France, May 23, 1972, 72.18242

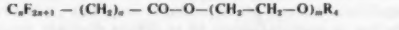
Int. Cl.² A62D *1/00*

U.S. Cl. 252—8.05 **20 Claims**

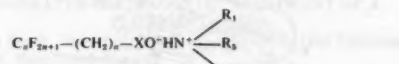
1. A surface-active fluorinated composition characterized by the association therein of from 35% to about 60% of at least one surface-active ampholyte compound of the formula



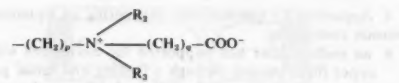
wherein n is an integer between 1 and 20, a is a number between 2 and 10, R_1 is an atom of hydrogen or an alkyl radical containing from 1 to 6 atoms of carbon, R_2 and R_3 are alkyl radicals containing from 1 to 3 atoms of carbon, at least one of which is the methyl radical and p and q are integers between 0 and 10; from about 20% to about 40% of at least one surface-active fluorinated non-ionic compound of the formula



wherein n and a have the same meaning as above, m is an integer between 1 and 20 and R_4 is an alkyl radical containing from 1 to 6 atoms of carbon; and from about 8% to about 40% of at least one amine salt compound of the formula



wherein X is the group CO or SO_2, R_1, R_5 and R_6 may be hydrogen atoms, alkyl radicals containing from 1 to 6 atoms of carbon, or the group



in which R_2, R_3, p and q have the values given above.

3,941,706

FUNCTIONAL LIQUID

Kuniaki Goto, Tokyo, and Tatsuo Sakashita, Yokohama, both of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

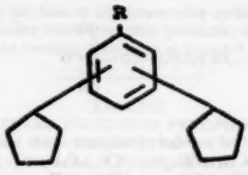
Filed June 13, 1974, Ser. No. 479,162

Claims priority, application Japan, June 20, 1973, 48-69418

Int. Cl.² C10M *1/16, 3/10, 5/08, 7/12*

U.S. Cl. 252—59 **3 Claims**

1. A functional liquid consisting essentially of at least one organic compound which is a dicyclopentylalkylbenzene represented by the following formula



wherein R is an alkyl group having 1 to 3 carbon atoms.

3,941,707

METHOD OF PRODUCING AN INSULATING MATERIAL FOR COATING CATHODE HEATER ELEMENTS

Eberhard Weiss, Stuttgart, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Nov. 23, 1973, Ser. No. 418,642
Claims priority, application Germany, Apr. 6, 1973, 2317445
Int. Cl.² C01F 7/02; C01G 41/00; C04B 43/00
U.S. Cl. 252—62 5 Claims

1. A method of producing an electrical insulating material for coating cathode heater elements including mixing a finely divided aluminum oxide powder and ammonium tungstate, rinsing the mixture with a liquid, drying the resultant mixture, and heating the mixture in a nitrogen and hydrogen atmosphere to provide a fine powder of aluminum oxide and ammonium tungstate.

3,941,708

HYDRAULIC FLUID ANTIOXIDANT SYSTEM

William F. Gentit, Weston, Conn., and Theodore A. Marolewski, New City, N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Feb. 11, 1974, Ser. No. 441,697
Int. Cl.² C09K 3/00; C10M 3/40
U.S. Cl. 252—78 26 Claims

1. A functional fluid composition comprising a mixture of a base stock material consisting essentially of an ester or esters of an acid of phosphorus, and from about 0.1 to about 10%, by weight of the total fluid, of an additive combination comprising an epoxycycloalkyl carboxylate and a phenyl naphthylamine, in a ratio of from about 1:10 to about 10:1 by weight.

24. A method for controlling acid buildup in an aircraft hydraulic fluid comprising a base stock selected from the group consisting of esters of an acid of phosphorus, which comprises incorporating in said hydraulic fluid from between about 0.1 to about 10% by weight of an additive comprising an epoxycycloalkyl carboxylate and a phenyl naphthylamine in a ratio of from about 1:10 to about 10:1 by weight.

3,941,709

FUNCTIONAL FLUID COMPOSITIONS CONTAINING EPOXIDE STABILIZERS

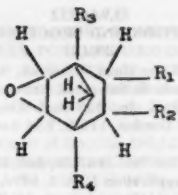
John F. Herber, St. Louis; William R. Richard, Jr., and Robert W. Street, both of Kirkwood, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Mar. 25, 1974, Ser. No. 454,650
Int. Cl.² C09K 3/00; C10M 3/40
U.S. Cl. 252—78 10 Claims

1. A functional fluid composition comprising at

A. least about 50 percent by weight of a base stock material selected from the group consisting of esters and amides of an acid of phosphorus, di- or tri- carboxylic acid esters, esters of polyhydric compounds, and mixtures thereof, and

B. from about 0.1 to 10 percent by weight of an epoxide compound represented by the structure



wherein R_1 is $-(CH_2)_{0-3}-C(O)OR$, $-C(O)R$, $-OR$, or $-CH_2OR$ where R is an alkyl radical having from 1 to about 18 carbon atoms, R_2 is R_1, hydrogen, or an alkyl radical having from 1 to about 9 carbon atoms, and R_3 and R_4 are individually hydrogen or an alkyl radical having from 1 to about 4 carbon atoms.

3,941,710

PHOSPHATE - FREE DISHWASHING COMPOSITIONS CONTAINING AN ALKYL POLYETHER CARBOXYLATE SURFACTANT

Allan H. Gilbert, Oradell, and Donald V. Kinsman, Tenafly, both of N.J., assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 246,734, April 24, 1972, abandoned. This application May 28, 1974, Ser. No. 474,121
Int. Cl.² C11D 1/06, 1/83, 3/08, 3/395
U.S. Cl. 252—99 1 Claim

1. A nonphosphate detergent composition suitable for use in mechanical dishwashing consisting of:

a. 2 percent to about 6 percent of a polyether carboxylate based on a C_{14}–C_{15} alcohol mixture condensed with 13.5 moles of ethylene oxide;

b. 20 percent to about 35% of a silicate having a $Na_2:SiO_2$ ratio of between about 1:2 to about 1:24;

c. 2% to about 6% of a low-foaming nonionic surface active agent;

d. 0.5% to about 1.5% of an anti-foaming agent selected from the group consisting of monostearyl acid phosphate and a eutectic mixture of stearic acid and palmitic acid;

e. 1 percent to about 2 percent of dichlorocyanurate, and

f. the balance comprising filler.

3,941,711

NOVEL COMBINATION SOAP BAR

Robert Malone Gipson, Austin, Tex., assignor to Jefferson Chemical Company, Inc., Houston, Tex.

Filed Jan. 24, 1974, Ser. No. 436,026
Int. Cl.² C11D 1/28, 9/32, 10/04, 17/00
U.S. Cl. 252—117 5 Claims

1. A combination soap bar effective in hard water that produces a stable lather and is substantially resistant to scum formation in the presence of hard water, said bar comprising:

about 80% by weight of a fatty acid soap of sodium, potassium or mixtures thereof wherein at least about 80% of said fatty acid soap is in the form of the sodium salt, and wherein at least 70% by weight of said fatty acid soap is a tallow soap; and

about 20% by weight of an alkali metal, amine or ammonium salt or mixtures thereof of an N-2(2-hydroxyethoxy)ethyl fatty amide-H-sulfate containing 12 to 18 carbon atoms in the fatty amide chain.

3,941,712

SOAP COMPOSITION AND PROCESS OF PRODUCING SUCH

Peter J. Ferrara, Ridge Road, Cornwall, N.Y. 12518; Gaston Dalby, St. Germain du Salembre, Neuvic-sur-L'Isle, France; Clarence A. Barnes, Jr., 829 Park Ave., New York, N.Y. 10021, and Roy Gordon, 110 E. End Ave., New York, N.Y. 10028

Continuation of Ser. No. 216,828, Jan. 10, 1972, Pat. No. 3,814,698. This application June 4, 1974, Ser. No. 476,301

Int. Cl.² C11D 9/24, 9/48, 13/10, 13/18

U.S. Cl. 252—126 6 Claims

1. In the process of producing solid, milled bar soap comprising:

A. heating a mixture of soap making ingredients comprising soap producing fatty acids, fatty acid glycerides or mixtures thereof and a saponifying proportion of alkali to an elevated saponifying temperature sufficient to form a hot liquid mixture of soap and water;

B. cooling said hot liquid mixture thereby solidfying such;

C. drying said mixture; and then

D. forming said dried solid mixture into solid bar soap by a process comprising milling, plodding and extruding; the improvement, whereby producing solid, milled bar soap containing about 5 to 100 weight percent, based upon the fatty acid content of said soap, of mineral oil, which comprises:

adding to said hot liquid mixture of soap and water produced by step A a substantially water insoluble additive comprising mineral oil whereby forming a homogeneous, hot liquid mixture comprising said soap, water and about 5 to 100 weight precent, based upon the fatty acid content of said soap, of said mineral oil; and

subjecting said homogeneous, hot liquid mixture to steps B, C and D as aforesaid.

3,941,713

RINSE COMPOSITION

Peter Leonard Dawson, Chester, England; Michael David Rickard, Deeside, Wales, and Michael Tom Rothwell, Bromborough, England, assignors to Lever Brothers Company, New York, N.Y.

Filed Oct. 1, 1973, Ser. No. 402,428

Claims priority, application United Kingdom, Oct. 4, 1972, 45680/72

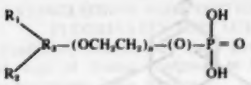
Int. Cl.² C02B 5/06

U.S. Cl. 252—142 5 Claims

1. A liquid rinse composition for use in machine dishwashing comprising

a. from 3–30% by weight of a low foaming nonionic surface active agent selected from the group consisting of polyoxyethylene-polyoxypropylene-polyoxyethylene polyols; polyoxyethylene-polyoxypropylene condensates of higher aliphatic alcohols having from 8–22 carbon atoms in the aliphatic portion and from 3–50 oxyalkylene units in the oxyalkylene portion; polyoxyethylene esters of higher fatty acids having from 8–22 carbon atoms in the acyl group and from 8–30 ethylene oxide units in the oxyethylene portion; and polyoxyethylene condensates of higher fatty acid amines and amides having from 8–22 carbon atoms in the fatty alkyl or acyl group and from 10–30 ethylene oxide units in the oxyethylene portion;

b. from 0.5–10% by weight of a monoalkylphosphate ester selected from the group consisting of esters of the general formula



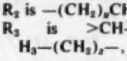
where

n, the actual number of ethylene oxide units, is 0–5;

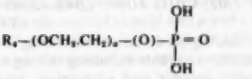
R_1 is $-(CH_2)_xCH_3$ or $-(CH_2)_xC_6H_5$;

R_2 is $-(CH_2)_xCH_3$ or $-(CH_2)_xC_6H_5$;

R_3 is $>CH-(CH_2)_x-$, $>CH-(CH_2)_x-C_6H_4-$, $>C_6H_3-(CH_2)_x-$, or



and x,y or z are zero or integers such that $x+y+z$ are from 7 to 17 when R_1, R_2 or R_3 comprise alkyl hydrocarbon groups and 6 to 16 when R_3 comprises aryl or hydroxyalkyl groups; and mono-substituted organic phosphates of the general formula



n being the actual number of ethylene oxide units and R_4 a linear alkyl hydrocarbon chain wherein when n is 0 R_4 is C_{10-16} alkyl and when n is from 1–5 R_4 is C_{10-18} alkyl; and

(c) from 35-80% by weight of lactic, citric or glutaric acid or a mixture thereof.

3,941,714

PROCESS FOR RECLAIMING RARE EARTH OXYSULFIDE PHOSPHORS

James E. Mathers; Ramon L. Yale, and H. David Layman, all of Ulster, Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Dec. 23, 1974, Ser. No. 535,493

Int. Cl.² C09K 1/46

U.S. Cl. 252—301.4 S 4 Claims

1. A process suitable for reclaiming cathodoluminescent europium-activated yttrium oxysulfide phosphor, contaminated with europium-activated yttrium oxide, and non-rare earth cathodoluminescent green and blue emitting sulfide phosphor materials said process comprising:

a. forming a relative uniform admixture of said contaminated oxysulfide phosphor, from about 0.5 to about 5.0 percent by weight of said admixture of a flux selected from the group consisting of alkali metal phosphates and alkali metal carbonates, a sufficient amount of a reactive rare earth source selected from reactive yttrium and europium sources to achieve a predetermined Y:Eu molar ratio in the europium activated yttrium oxysulfide formed upon subsequent heating and an excess of the theoretical amount of sulfur required to convert said yttrium oxide and said yttrium source to yttrium oxysulfide; said reactive yttrium and europium sources forming europium activated yttrium oxysulfide and water soluble or volatile reaction products upon said subsequent heating

b. heating said admixture at a temperature of at least 850°C in non-oxidizing atmosphere for a time sufficient to convert said europium activated yttrium oxide and said yttrium and europium sources to a europium-activated yttrium oxysulfide cathodoluminescent material having said predetermined Y:Eu ratio whereby the non-rare earth sulfide phosphor materials form water soluble reaction products.

c. washing the heated admixture with sufficient water to remove water soluble reaction products, and
d. drying the resulting europium-activated Y_2O_2S.

3,941,715
SUBSTITUTED ZIRCONIUM PYROPHOSPHATE PHOSPHORS

Igal Shidlovsky, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 24, 1975, Ser. No. 561,354
Int. Cl.² C09K 11/42
U.S. Cl. 252—301.4 P 5 Claims

1. A luminescent material consisting essentially of $Zr_{1-x}M_xP_2O_7$, wherein M is at least one of Hf, Ge and Si, and x is in the range of 0.0001 and 0.20, said luminescent material having a cathodoluminescent power efficiency greater than that of unsubstituted self-activated ZrP_2O_7 phosphor.

3,941,716
PROCESS FOR REACTIVATION OF IRIDIUM-CONTAINING CATALYSTS

John D. Paynter, Louisville, Ky., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Aug. 16, 1973, Ser. No. 388,908
Int. Cl.² B01J 23/96; C10G 35/08
U.S. Cl. 252—415 23 Claims

1. In a process for reactivating a reforming catalyst, which includes an iridium component composited with a refractory porous inorganic oxide, previously inactivated by coke deposition thereon during contact with a hydrocarbon feed at hydrocarbon conversion conditions and subsequently regenerated by burning at elevated temperatures in the presence of oxygen containing gases to remove accumulated coke deposits therefrom, the improved combination which comprises:
contacting, without interim contact with a substantially halogen-free, oxygen-containing gas at temperatures in excess of about 775°F., a bed of the coke-depleted catalyst in a cycle which includes, in sequence, the steps of
i. contacting the coke-depleted catalyst with hydrogen or a hydrogen-containing gas at a temperature sufficient to reduce the said iridium component and then
ii. contacting said reduced catalyst at an elevated temperature from about 550°F to about 1150°F in a reaction zone provided with exposed ferrous metal surfaces with a gas comprising elemental halogen or halogen precursor and water in amount ranging from about 0.1:1 to 15:1 molar ratio of water:halogen, in a non-oxygen containing atmosphere, sufficient to suppress corrosion of the ferrous metal surfaces of the reaction zone and to effect redispersion of the iridium.

3,941,717
PROCESS FOR THE PRODUCTION OF A CATALYST COMPRISING A NOVEL METAL ON ACTIVATED CARBON

Gerhard Vollheim, Hanau; Karl-Jurgen Troger, Grossauheim, and Gerhard Lippert, Kleinostheim, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Germany

Filed Sept. 27, 1972, Ser. No. 292,797
Claims priority, application Germany, Oct. 8, 1971, 2150200
Int. Cl.² B01J 21/18
U.S. Cl. 252—430 19 Claims

1. A process for the production of a catalyst of a noble metal on activated carbon suitable for the selective hydrogenation of chloronitro-aromatic compounds comprising treating the noble metal-activated carbon with a sulfoxide of the formula R_1SOR_2 where R_1 and R_2 are alkyl, aralkyl or aryl and then with a hydrazine material having the formula R_3NHNH_2 where R_3 is hydrogen, alkyl, aryl, aralkyl or alkenyl.

3,941,718
INSOLUBLE CROSSLINKED HOMOPOLYMERS AND COPOLYMERS, POLYMERIZED ON AN INERT SUBSTRATE

Eugene S. Barabas, Waichung, and Frederick Grosser, Midland Park, both of N.J., assignors to GAF Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 294,522, Oct. 3, 1972, abandoned. This application May 30, 1974, Ser. No. 474,802
Int. Cl.² B01J 31/06
U.S. Cl. 252—430 5 Claims

1. An improved method for the forming of an improved adsorbent consisting essentially of an insoluble, cross-linked polymeric coating having selective adsorption properties and an inert, porous carrier comprising:
a. blending (1) at least one monomer selected from the group consisting of N-vinyl-2-pyrrolidone, vinyl acetate, a mono-alkyl maleate, a mono-alkyl fumarate, itaconic acid, crotonic acid, acrylic acid, methacrylic acid, acrylamide, methacrylamide, dimethylacrylamide, and mixtures thereof, (2) a cross-linking agent which is a polyfunctional monomer containing more than one polymerizable unsaturated group selected from the group consisting of divinyl benzene, methylene-bis-acrylamide, ethylidine-bis-vinyl pyrrolidone, divinyl ethers of polyalkylene glycol, divinyl ketone, butadiene, isoprene, diallyl, diallyl ethers, diallylphthalate, allyl acrylate, and mixtures thereof, and (3) an inert solid carrier comprising about 50% to about 99% by weight of the adsorbent, the weight ratio of said monomer to said cross-linking agent being within the range of from about 99.9:0.1 to about 1:1, respectively, the monomer and cross-linking agent being employed in a sufficient amount to achieve a uniform distribution of said materials over the surface area of the inert carrier, and
b. subjecting said blend to polymerization-inducing conditions so as to polymerize said monomer and said cross-linking agent in situ on the surface of said carrier, thus forming an insoluble polymeric film completely covering the surface area of said carrier, whereby the polymeric selective adsorbent having an enhanced availability of active sites available for adsorption is produced.

3,941,719
TRANSPARENT ACTIVATED NONPARTICULATE ALUMINA AND METHOD OF PREPARING SAME

Bulent E. Yoldas, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 281,434, Aug. 17, 1972, abandoned, and a continuation-in-part of Ser. No. 234,303, March 13, 1972, abandoned. This application Sept. 10, 1973, Ser. No. 395,953
Int. Cl.² C01F 7/02; B01J 23/08
U.S. Cl. 252—463 18 Claims

1. A method for preparing an essentially transparent, monolithic, nonparticulate, porous, partially pyrolyzed product consisting essentially of aluminum monohydrate and alumina which comprises the steps of:
a. providing an acid peptized, clear colloidal solution by hydrolyzing an aluminum alkoxide of the formula $Al(OR)_3$, wherein R is an alkyl of 1–24 carbon atoms, with water, wherein the mole ratio of water to said alkoxide is at least 8:1 and wherein said acid peptization is effected with about 0.03 to about 0.250 moles of acid per mole of said alkoxide, said acid having an ionization constant of at least 1×10^{-5} and having a noncomplexing anion with aluminum,
b. gelling said clear solution, and
c. drying said gel and partially pyrolyzing same by heating at a rate sufficiently slow to preclude cracking at a temperature range of about 100° to about 500°C. so as to form said transparent monolithic, porous, nonparticulate partially pyrolyzed product, said product upon further

heating at about 500°C., or above, being convertible to a transparent, porous, monolithic, nonparticulate Al_2O_3.

17. A method for preparing a transparent, monolithic, nonparticulate, porous, partially pyrolyzed product consisting essentially of aluminum monohydrate and alumina which comprises the steps of:

a. providing a gel of the hydrolysis product obtained by hydrolyzing an aluminum alkoxide of the formula $Al(OR)_3$, wherein R is an alkyl of 1–24 carbon atoms, with water and an acid wherein the mole ratio of water to said alkoxide is in the range of 8:1 to 20:1 and wherein said acid is employed in an amount of about .03 to about .250 moles of acid per mole of said alkoxide, said acid having an ionization constant of at least 1×10^{-5} and having a noncomplexing anion with aluminum,

b. drying said gel, and

c. partially pyrolyzing said dried gel by heating at a rate sufficiently slow to preclude cracking at a temperature of about 100°C. to about 500°C. so as to form said transparent, monolithic, porous, nonparticulate product, said product upon further heating at about 500°C., or above, being convertible to a transparent, porous, monolithic, nonparticulate Al_2O_3.

3,941,720
METHOD OF PRODUCING A RANEY COPPER CATALYST AND THE CATALYST SO MADE

Karl H. Hoffmann, Sauk Village, and Donald R. Anderson, Oswego, both of Ill., assignors to Nalco Chemical Company, Chicago, Ill.

Continuation-in-part of Ser. No. 473,266, May 24, 1974, abandoned, which is a continuation-in-part of Ser. No. 405,874, Oct. 12, 1973, abandoned. This application June 28, 1974, Ser. No. 484,175

Int. Cl.² B01J *21/04, 23/72*

U.S. Cl. 252—463 **27 Claims**

1. In an improved process for preparing a Raney copper catalyst, said catalyst comprising from about 2 to 45 weight percent aluminum with the balance up to 100 weight percent being copper, the improvement which comprises contacting particles of a metal alloy comprised of copper and aluminum with an aqueous solution which had dissolved therein on a 100 weight percent total by-product free solution basis from greater than 0 to about 25 weight percent alkali metal hydroxide and at least one soluble polyhydroxylated carboxylic acid which has a solubility in water at least about 5 weight percent said acid being selected from the group consisting of (a) a compound of the formula:

$$HOCH_2 - (CHOH)_n - COOH$$

where *n* can range from 3 through 6 as well as the alkali metal salts, the ammonium salt, the lower alkanol esters and lactones thereof and (*b*) citric acid.

3,941,721
CATALYST FOR THE MANUFACTURE OF GASES CONTAINING METHANE

Franz Josef Broecker; Guenter Zirker; Bruno Triebskorn; Laszlo Marosi, all of Ludwigshafen; Matthias Schwarzmann, Limburgerhof; Winfried Dethlefsen, Ludwigshafen, and Knut Kaempfer, Frankenthal, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Nov. 13, 1973, Ser. No. 415,407

Claims priority, application Germany, Nov. 15, 1975, 2255909

Int. Cl.² B01J *21/04, 23/74*

U.S. Cl. 252—466 J **4 Claims**

1. A catalyst produced by the process consisting essentially of precipitating the compound $Ni_6Al_2(OH)_{16}.CO_3.4H_2O$ as a catalyst precursor from an aqueous medium; drying said precipitate at a temperature of from 80° to 180°C; raising the temperature of said precipitate between the drying stage and the calcination stage at a gradient of 1.66°C/minute to 3.33°C/minute; calcining said precipitate at a temperature of from 300° to 550°C; and thereafter reducing said precipitate in a stream of hydrogen to form said catalyst.

3,941,722
BATH BEADS CONTAINING ALLANTOIN

Edward J. Shevlin, Signal Mountain, Tenn., assignor to Chattem Drug & Chemical Company, Chattanooga, Tenn.

Filed May 6, 1974, Ser. No. 467,218

Int. Cl.² A61K *7/50;* **C11D** *3/28, 3/32, 3/48*

U.S. Cl. 252—524 **6 Claims**

1. A free-flowing bath bead composition comprising from 0.1 part to 2.0 percent allantoin, from 0.10 to 2.0 percent allantoin proteinate containing from 5 to 7 percent by weight allantoin, and a substantive protein derived from collagen and comprising straight chain polypeptides with a molecular weight up to 10,000, from 0.50 to 5.0 percent of a collagen hydrolysate, and from 10 to 84 percent of water softener.

3,941,723
CRYSTALLIZED ALKALI METAL SILICATE WITH SEQUESTERING AGENTS

Helmut H. Weldes, Havertown, Pa., assignor to Philadelphia Quartz Company, Valley Forge, Pa.

Filed May 14, 1971, Ser. No. 143,626

Int. Cl.² B01J *17/06, 17/20;* **C11D** *7/14, 7/32*

U.S. Cl. 252—527 **5 Claims**

1. A process for the production of free flowing, non-caking readily soluble granules comprising the steps of

a. preparing an alkali metal silicate liquor having an M_2O:SiO_2 mole ratio of 0.96 to 2.3:1.0 and a solids content of at least 30%,

b. introducing a sequestering agent of particle size less than 65 mesh into said silicate liquor, the ratio of said sequestering agent solids to alkali metal silicate solids being up to 2.5:1.0 and selected from the group consisting of sodium salts of organic amino acids, potassium salts of organic amino acids sodium salts of organic hydroxy acids, potassium salts of organic hydroxy acids, sodium salts of organic polyhydroxy acids, potassium salts of organic polyhydroxy acids,

c. crystallizing the resultant solution to obtain an easily crushable cake,

d. crushing said cake to obtain the desired granules.

3,941,724
PRODUCTION OF AMPHOTERIC RESINS IN A REACTION MEDIUM COMPRISING FORMIC ACID

Brian Alfred Bolto, Mitcham, Australia, assignor to ICI Australia Limited, Melbourne and Commonwealth Scientific and Industrial Research Organization, Campbell, both of Australia

Filed July 26, 1974, Ser. No. 492,966

Claims priority, application Australia, Aug. 9, 1973, 4415/73

Int. Cl.² C08F *20/04;* **C08J** *5/20;* **C08F** *22/02, 2/54*

U.S. Cl. 260—2.1 R **7 Claims**

1. In the process of manufacturing a polymeric composition which process comprises firstly polymerizing a mixture comprising a monomer containing a basic group, said monomer being an ethylenically unsaturated substituted amine, and a monomer containing an acidic group, said latter monomer being an unsaturated carboxylic acid; the improvement of carrying out the process in the presence of a solvent system comprising formic acid.

3,941,725

PROCESS FOR THE MANUFACTURE OF EPOXIDE RESIN FOAMS

André Schmitter, Hegenheim, France; Rolf Hügi, Basel, and Wolfgang Seiz, Pfeffingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

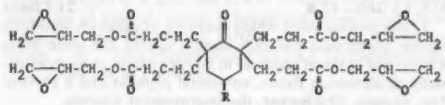
Filed Sept. 9, 1974, Ser. No. 504,629

Claims priority, application Switzerland, Sept. 14, 1973, 13276/73

Int. Cl.² C08G 59/12, 59/20; C08J 9/02, 9/30

U.S. Cl. 260—2.5 EP 3 Claims

1. Process for the manufacture of epoxide resin foams using a resin mixture which contains an epoxide resin based on bisphenol A or a polyester containing epoxide groups and/or an aliphatic polyglycidyl ether and/or a cycloaliphatic epoxide resin and also a blowing agent and a surface-active agent for regulating the pore structure, characterised in that the resin mixture furthermore contains the tetraglycidyl ester of cyclohexanone- or methylcyclohexanone-tetrapropionic acid of the formula I



in which R denotes hydrogen or the methyl group, and that the curing is carried out with a Lewis acid or an addition compound or complex compound of a Lewis acid.

3,941,726

POLYGUANIDINE FOAMS

Rolf Wiedermann, Bergisch-Gladbach, Germany, and Andrea La Spina, Garbagnate Milan, Italy, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 2, 1974, Ser. No. 457,291

Claims priority, application Germany, Apr. 11, 1973, 2318168

Int. Cl.² C08G 18/02; C08J 9/04

U.S. Cl. 260—2.5 N 5 Claims

1. A process for producing a polyguanidine foam which comprises reacting a solid polycarbodiimide foam with a fluid containing a primary or secondary amine or ammonia.

5. A method of making polyguanidine foam which comprises contacting a carbodiimide foam with a fluid containing hydrazine, ammonia or a primary or secondary amine, said polycarbodiimide foam having been prepared from a reaction mixture containing an organic polyisocyanate, addition product of phospholine oxide or sulfide and an alcohol or a protonic acid which in a N/10 aqueous solution has a pH of 1 to 8, a metal salt or an acid chloride and optionally a blowing agent.

3,941,727

HYDROPHILIC AQUEOUS COATING COMPOSITION CONTAINING AQUEOUS BINDER SOLUTION AND SELECT HOMOGENEOUS AQUEOUS DISPERSION OF POLYMER PARTICLES

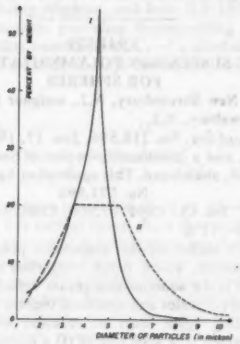
Daniel Maurice Timmerman, Mortsel; Victor Jan Thijs; Walter Frans De Winter, both of Berchem; Frans Henri Claes, and Hubert Vandenabeele, both of Mortsel, all of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Oct. 23, 1973, Ser. No. 408,491

Claims priority, application United Kingdom, Nov. 22, 1972, 53896/72

Int. Cl.² C08L 89/00

U.S. Cl. 260—8 11 Claims



1. Hydrophilic coating composition containing an aqueous binder solution and a homogeneous aqueous dispersion of polymer particles, said dispersion prepared by dissolving a water-insoluble, film-forming polymer in a water-insoluble ethylenically unsaturated monomer which is liquid at room temperature to provide a solution thereof, dispersing by stirring the solution thus formed in an aqueous solution of a hydrophilic colloid and dispersing agent, the stirring being continued until a stable dispersion of polymer-in-monomer solution droplets having a diameter between 1 and 10 micron is formed in said aqueous solution and, while continuously stirring in the presence of a free-radical forming polymerization initiator, heating the dispersion to the decomposition temperature of said polymerization initiator to effect polymerization of said water-insoluble liquid monomer and to form an aqueous dispersion of solvent-free polymer particles, said unsaturated monomer being selected so as to be a solvent at room temperature for said film-forming polymer, and to provide upon said polymerization in the presence of said film-forming polymer, polymer particles having a glass transition temperature of at least 60°C., and said binder of said aqueous binder solution when in an aqueous solution being compatible with said dispersion.

3,941,728

POLYVINYL ALCOHOL-POLYSACCHARIDE MICROGELS

John Carl Solenberger, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 259,666, June 5, 1972, abandoned. This application July 9, 1974, Ser. No. 486,900

Int. Cl.² C08L 1/32, 3/02, 29/04

U.S. Cl. 260—17 R 8 Claims

1. A mixture of polyvinyl alcoholpolysaccharide microgel in water comprising water and, based on the total mixture, 0.1 to 10 percent by weight of a partially crosslinked mixture of polyvinyl alcohol and polysaccharide in which the mixture is partially crosslinked with a titanium complex containing tetravalent titanium ions in an amount of 0.05 to 10 parts by weight

per 100 parts of said mixture of polyvinyl alcohol and polysaccharide, said polyvinyl alcohol being present in the amount of 0.05 to 9.95 percent by weight, said polysaccharide being present in the amount of 0.05 to 9.95 percent by weight and being selected from the group consisting of 0.05 to 9.95 percent by weight of starch and 0.05 to 3 percent by weight of sodium carboxymethylcellulose, said microgel being a stable fluid derived from polyvinyl alcohol which has a Hoeppler viscosity of 4 to 150 centipoises and in which at least 50 mole percent of the monomeric units are vinyl alcohol units, the water and partially crosslinked mixture of polyvinyl alcohol and polysaccharide having a Brookfield viscosity of 1.15 to 1000 centipoises, the viscosity being at least 15 percent greater than the viscosity of the aqueous polyvinyl alcohol-polysaccharide mixture from which the microgel is derived.

3,941,729

STYRENE SUSPENSION POLYMERIZATION SYSTEM FOR SPHERES

Max Klein, New Shrewsbury, N.J., assignor to Normac, Inc., New Shrewsbury, N.J.

Division of Ser. No. 218,596, Jan. 17, 1972, Pat. No. 3,880,771, and a continuation-in-part of Ser. No. 700,704, Jan. 26, 1968, abandoned. This application Apr. 28, 1975, Ser. No. 571,998

Int. Cl.[2] C08F *112/00*; C08L *1/28*

U.S. Cl. 260—17 A **11 Claims**

1. A batch useful for the suspension polymerization of a styrene-monomer, which batch comprises (A) an aqueous phase which is the aqueous suspension vehicle which consists essentially of (a) water and dissolved therein (b) a water-soluble suspending agent inert to reaction with the styrene-monomer, which is at least one of (i) a hydroxyethylcellulose having a viscosity within the range of one whose 2% by weight, on dry basis, aqueous solution at 20° C. has a Hoopler viscosity of from 6175 to 7600 centipoises (ii) a hydroxyethylcellulose whose whole such 5% aqueous solution at 20° C. has a Hoopler viscosity of from 120 to 160 centipoises, (iii) carboxymethylcellulose, (iv) polyacrylic acid, (v) polymethacrylic acid, (vi) the sodium or ammonium salt of any of the carboxylic acid substances (iii), (iv), and (v), and (vii) polyvinyl alcohol; said suspending agent being present in said suspension vehicle in a concentration above that which will allow the produced styrene-polymer to agglomerate under the polymerization conditions and below about 0.4 weight percent, and (c) from about 0.01 to about 0.5 percent of a water-soluble organic solvent for said suspending agent, which solvent is selected from the group consisting of formic acid, dimethylformamide, dimethylacetamide, tetrahydrofuran, ethylenediamine, diethylenetriamine, 2-bromopyridine, and 3-cyanopyridine; and (B) an organic phase composed of a styrene-monomer having dissolved therein a styrene-monomer polymerization effective amount of a styrene-monomer polymerization free radical-providing catalyst; said suspending agent being present in the range of from about 0.2 to about 1 pound thereof for each about 50 pounds of the styrene-monomer, and said styrene-monomer is present in the range of from about 1 pound thereof for each from about 6 to about 7 pounds of water.

3,941,730

POLYVINYL ALCOHOL MICROGEL PRECURSOR BLENDS

John Carl Solenberger, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 259,665, June 5, 1972, abandoned. This application July 9, 1974, Ser. No. 486,899

Int. Cl.[2] C08L *29/04*, *1/32*, *3/02*

U.S. Cl. 260—17 R **7 Claims**

1. A dry blend for forming a stable, fluid polyvinyl alcohol containing microgel in water having a Brookfield viscosity of 1.15 to 1000 centipoises which comprises (A) a polymer mixture consisting of at least about 0.5 percent by weight of polyvinyl alcohol and one or more polysaccharide selected from the group consisting of up to 99.5 percent by weight of starch and up to 33 percent by weight of sodium carboxymethylcellulose, said polyvinyl alcohol having a Hoeppler viscosity of 4 to 150 centipoises measured as a 4 percent aqueous solution at 20°C. by the falling ball method and having at least 50 mole percent of the monomeric units present as vinyl alcohol units, (B) water-soluble, solid titanium salt of a hydroxy carboxylic acid of 2 to 10 carbon atoms in an amount which provides 0.05 to 10 parts by weight of tetravalent titanium ion per 100 parts of said polymer mixture, and (C) 0.05 to 20 parts by weight of water-soluble, solid hydroxy carboxylic acid of 2 to 10 carbon atoms per 100 parts of said polymer mixture.

3,941,731

POWDER PAINTS CONTAINING ALUMINUM AND NICKEL II

Melville J. Cameron, Utica, and Rodney C. Gibeau, Mount Clemens, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 422,470, Dec. 6, 1973, abandoned. This application Sept. 16, 1974, Ser. No. 506,491

Int. Cl.[2] C08K *3/08*, *9/04*, *9/10*

U.S. Cl. 260—17 R **21 Claims**

1. In a powder paint which exclusive of catalysts, antistatic agents, plasticizers and flow control agents, the same being known and optional additives to powder paints, consists essentially of aluminum flakes, non-metal pigment and a particulate, organic, film-former, the improvement wherein

A. said non-metal pigment comprises 0 to about 22 weight percent of said powder paint,

B. said aluminum flakes comprise about 0.005 to about 25 weight percent of said powder paint and are encapsulated prior to admixture with said particulate, organic, film-former with about 2 to about 200 parts by weight of a continuous coating of a thermoplastic organic, film-former per 100 parts by weight aluminum flakes, said thermoplastic, organic, film-former consisting essentially of thermoplastic, organic film-formers selected from the group consisting of

1. polymers of alpha-beta olefinically unsaturated monomers of which about 51 to about 100 weight percent are acrylic monomers aid 0 to about 49 weight percent are monovinyl hydrocarbons,
2. polyamides,
3. polyesters,
4. homopolymers of monovinyl hydrocarbons,
5. cellulose acetate, and
6. cellulose butyrate,

C. nickel powder is dispersed in said powder paint, the weight ratio of said nickel powder to the encapsulated aluminum flakes being between about 1:4 and about 5:1, and

D. said particulate, organic film-former is

1. a thermoplastic, particulate, film-former that is a polymer of alpha-beta olefinically unsaturated monomers of which about 51 to about 100 weight percent are acrylic monomers and 0 to about 49 weight percent are monovinyl hydrocarbons, and
2. thermosettable, particulate, film-formers consisting essentially of a copolymer having average molecular weight (M_n) in the range of about 1500 to about 15,000 and gloss transition temperature in the range of about 40°C. to about 90°C., bearing functional groups provided by constituent monomers selected from the group consisting of glycidyl esters of a monoethylenically unsaturated carboxylic acid, C_5 – C_7 monohydroxy acrylates, C_5 – C_7 monohydroxy methacrylates and alpha-beta olefinically unsaturated amides and wherein at least above 50 weight percent of the constituent monomers are acrylic monomers and the remainder weight percent, if any, of the constituent monomers

consist essentially of $C_8 - C_{12}$ monovinyl hydrocarbons, said copolymer being self-crosslinkable or employed in combination with a monomeric or polymeric crosslinking agent that is capable of reacting with said functional groups on said copolymer.

3,941,732

VULCANIZABLE RUBBER COMPOSITION HAVING IMPROVED PHYSICAL PROPERTIES

Toshio Yukuta, Kodaira; Takashi Ohashi, Iruma, and Hiroshi Yoshsii, Kodaira, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Dec. 12, 1974, Ser. No. 531,971

Claims priority, application Japan, Dec. 18, 1973, 48-140372

Int. Cl.² C08C *19/22*; C08L *7/00*, *9/06*

U.S. Cl. 260—23.7 B 8 Claims

1. A vulcanizable rubber composition which comprises rubber and 3,9-bis(2-hydrazidoethyl)-2,4,8,10-tetraoxaspiro-[5,5]-undecane as a stiffener.

6. A vulcanizable rubber composition which comprises 100 parts by weight of at least one rubber selected from the group consisting of natural rubber, polyisoprene, styrene-butadiene copolymer and the mixture thereof and 0.5 – 2.0 parts by weight of 3,9-(2-hydrazidoethyl)-2,4,8,10-tetraoxaspiro-[5,5]-undecane as a stiffener.

3,941,733

SILANOL-CONTAINING URETHANE DISPERSIONS

Joe H-S Chang, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 2, 1975, Ser. No. 538,153

Int. Cl.² C08J *3/10*; C08L *75/00*

U.S. Cl. 260—29.2 M 5 Claims

1. An aqueous dispersion of poly(urethane-urea) characterized in having a poly(urethane-urea) backbone containing interspersed bound water-solubilizing ionic groups pendant from said backbone and terminal mutually interractive silyl groups.

3,941,734

PROCESS FOR PREPARING A SULFITE MODIFIED MELAMINE RESIN SOLUTION

Alois Aignesberger, Trostberg, Upper Bavaria, and Paul Bornmann, Stein an der Traun, both of Germany, assignors to Suddeutsche Kalkstickstoff-Werke Aktiengeselbschaft, Trostberg, Germany

Filed Apr. 17, 1974, Ser. No. 461,614

Int. Cl.² C08L *61/20*

U.S. Cl. 260—29.4 R 4 Claims

1. In a process for preparing a solution of sulfite modified melamine resin, wherein melamine is dissolved in aqueous formaldehyde solution at elevated temperature, the clear solution so formed is cooled, an alkali metal sulfite is dissolved in the cooled solution, the resulting sulfite bearing solution is adjusted to a pH value above 7, heated, again cooled, acidified, and heated to cause formation of said resin by condensation, and the condensation mixture obtained is adjusted to a pH value above 7, the improvement which comprises heating said condensation mixture at pH 8 to 11 for 1 to 3 hours at a temperature at which said mixture refluxes at atmospheric pressure.

3,941,735

AQUEOUS EMULSION ADHESIVE OF A COPOLYMER OF AN ALCOHOL ETHER OF N-METHYLOL DERIVATIVE OF AN ALLYL CARBAMATE WHICH DEVELOPS WATER RESISTANCE THROUGH CURE

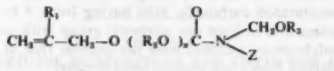
Martin K. Lindemann, Greenville, S.C., assignor to Chas. S. Tanner Co., Greenville, S.C.

Filed Sept. 26, 1973, Ser. No. 401,088

Int. Cl.² C08L *33/24*, *29/04*, *1/26*

U.S. Cl. 260—29.6 WB 16 Claims

10. An aqueous adhesive emulsion which develops water resistance through cure, the water of said emulsion having emulsified therein an aqueous emulsion copolymer consisting essentially of monoethylenic monomers, at least 55% up to 94.5% of the copolymer being vinyl acetate, from 5–40% of the copolymer being ethylene, and from 0.5–15% of the copolymer of monomers providing thermosetting characteristics, and consisting essentially of $C_1 - C_8$ alcohol ether of an N-methylol derivative of an allyl carbamate having the formula:



in which R_1 is hydrogen or methyl, R_2 is an alkylidene group containing from 2–4 carbon atoms, R_3 is the residue of the $C_1 - C_8$ etherifying alcohol, Z is hydrogen or another $—CH_2OR_3$ group, and n is an integer from 0–10, the monomers of said copolymer being emulsified during copolymerization by from 0.05 to 10% of an hydroxy functional protective colloid.

11. An aqueous adhesive emulsion as recited in claim 1 in which said copolymer consists essentially of vinyl acetate, ethylene, and $C_1 - C_4$ alcohol ether of mono-N-methylol allyl carbamate, and said protective colloid is polyvinyl alcohol.

3,941,736

STABLE AQUEOUS DISPERSIONS OF HYDROCARBON RESINS AND WATER SOLUBLE POLYAMINOPOLYAMIDE-EPICHLOROHYDRIN RESIN AS DISPERSING AGENT

Paul Harwood Aldrich, Greenville, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Nov. 5, 1973, Ser. No. 413,065

Int. Cl.² C08L *77/06*, *25/08*

U.S. Cl. 260—29.6 NR 4 Claims

1. An essentially stable aqueous hydrocarbon resin dispersion consisting essentially of, by weight, from about 5.5 parts to about 50 parts solids and from about 94.5 parts to about 50 parts water; the solids content consisting essentially of, by weight, (a) from about 5 parts to about 45 parts hydrocarbon resin particles and (b) from about 0.5 part to about 10 parts of a water-soluble cation polymeric dispersing agent, component (a) being a hydrocarbon resin from ethylenically unsaturated hydrocarbon monomers having a ring and ball softening point of from about 45°C. to about 150°C., a molecular weight of from about 350 to about 2000, and an acid number of less than about 1, component (b) being a water-soluble polyaminopolyamide—epichlorohydrin resin consisting essentially of the reaction product of an aminopolyamide and epichlorohydrin utilizing from about 1 mole to about 1.5 moles of epichlorohydrin for each amine group of the aminopolyamide, said aminopolyamide consisting essentially of the reaction product of a polyalkylenepolyamine and a dicarboxylic acid in a mole ratio of polyalkylenepolyamine to dicarboxylic acid of from about 0.8:1 to about 1.4:1.

3,941,737

PVC PLASTISOLS CONTAINING INORGANIC PEROXIDES

Helmut Horstkorte, Monheim-Baumberg, and Wilhelm Clas, Duisburg-Meiderich, both of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf-Holthausen, Germany

Filed May 30, 1974, Ser. No. 474,606
Claims priority, application Germany, June 1, 1973, 2327957
Int. Cl.² C08K 5/49
U.S. Cl. 260—30.6 R 7 Claims

1. A PVC plastisol comprising

A. from 10 to 50% by weight of a plasticizable polymer selected from the group consisting of polyvinyl chloride and copolymers of vinyl chloride with up to 20% by weight of ethylenically unsaturated monomers copolymerizable with vinyl chloride,

B. from 6 to 60% by weight of a plasticizers for polyvinyl chloride, wherein the ratio of component A to component B is from 1:0.6 to 1:2,

C. from 1 to 20% by weight of an ester of an α,β-unsaturated carboxylic acid having from 3 to 8 carbon atoms and at least one carboxyl group with an aliphatic polyhydroxy alcohol, with the proviso that at least two olefinic bonds are present in said ester,

D. from 0.1 to 6% by weight of a solid inorganic percompound selected from the group consisting of an alkaline earth metal peroxide, an alkali metal peroxycarbonate, an alkali metal perborate, an alkali metal permanganate, alkali metal perchlorate, alkali metal persulfate and the mixtures thereof, and

E. from 0 to 70% by weight of inert material selected from the group consisting of inorganic fillers and mineral pigments.

3,941,738

NON-PHASING CHLOROPRENE POLYMER ADHESIVE COMPOSITION AND PREPARATION THEREOF

Yasuaki Denda; Takashi Kadowaki, and Michio Dohi, all of Omi, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 1, 1973, Ser. No. 411,820
Claims priority, application Japan, Nov. 2, 1972, 47-110018
Int. Cl.² C08K 5/01, 5/02, 5/09; C08L 61/10
U.S. Cl. 260—31.2 T 13 Claims

1. In a non-phasing chloroprene polymer adhesive composition comprising:

a. 100 parts by weight of a chloroprene polymer;

b. 1–50 parts by weight of a metal oxide;

c. 5–100 parts by weight of an alkylphenol-formaldehyde resin,

a, b and c being admixed with an organic solvent so as to obtain a solids content of said adhesive composition of from 5–60%;

the improvement wherein said chloroprene polymer is prepared by the emulsion polymerization of chloroprene or a mixture of chloroprene and a comonomer in the presence of a salt of a C_4–C_8 aliphatic substituted benzoic acid surfactant.

3,941,739

FLOWABLE FLOCCULANTS FOR WATER TREATMENT

Jack R. Newman, Skokie, Ill., assignor to Swift and Company Limited, Chicago, Ill.

Filed May 20, 1974, Ser. No. 471,316
Int. Cl.² C08K 5/06
U.S. Cl. 260—33.2 R 11 Claims

1. A fluidized flocculant for use in an aqueous system comprising a dispersion of a finely ground polyacrylamide flocculating agent in a polyhydric alcohol carrier having an approximate molecular weight greater than 65 and less than 500 said dispersion being flowable at room temperature, the concentration of said flocculating agent in the dispersion being substantially greater than the concentration dissolvable in the aqueous system.

3,941,740

METHOD OF DISPERSING CARBON BLACK IN LIQUID ELASTOMERS

William W. Barbin, Massillon, Ohio, and Joseph C. Sanda, Jr., Youngstown, N.Y., assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Feb. 20, 1974, Ser. No. 444,081
Int. Cl.² C08K 5/01, 3/04
U.S. Cl. 260—33.6 AQ 39 Claims

1. A low shear method of adequately dispersing carbon black in liquid elastomers comprising the steps of:

adding to a container a liquid elastomer,

an amount of from 5 to about 60 parts by weight of a hydrocarbon oil,

adding to said container from 30 to about 60 parts by weight based on 100 parts of said liquid elastomer of an oil beaded carbon black containing from 25 to about 100 parts by weight of carbon black and containing said entire amount from 5 parts to about 60 parts by weight of said hydrocarbon oil so that said entire amount of hydrocarbon oil is added in the form of an oil beaded carbon black,

mixing said compounds to produce a low viscosity, carbon black dispersed elastomeric composition,

and mixing said compounds in a lower shear mixer.

3,941,741

SELF-BONDING, HEAT-CURABLE SILICONE RUBBER

George P. De Zuba, Waterford; Abe Berger, and Terry G. Selin, both of Schenectady, all of N.Y., assignors to General Electric Company, Waterford, N.Y.

Continuation of Ser. No. 144,249, May 17, 1971, Pat. No. 3,730,932. This application Nov. 17, 1972, Ser. No. 307,515
Int. Cl.² C08L 83/04
U.S. Cl. 260—37 SB 13 Claims

1. A process for forming a self-bonding, heat-curable silicone rubber with superior adhesion to substrates comprising mixing from 82 to 99.65% by weight of an organopolysiloxane polymer having a viscosity of at least 100,000 centipoise at 25°C of the formula,

$$(R)_nSiO_{(4-n)/2},$$

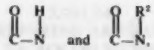
with from 0.1 to 8% by weight of a curing catalyst and from 0.25 to 10% by weight of a self-bonding additive selected from the group consisting of the formula,

$$R^6—\underset{\underset{R^5—C—Z—G',}{\|}}{C}—Z—R^5$$

and of the formula,

$$R^6—\underset{\underset{G'—Z—C—R^6}{\|}}{C}—Z—R^5$$

where R is selected from monovalent hydrocarbon radicals and halogenated monovalent hydrocarbon radicals, R^6 is selected from alkyl radicals and hydrogen, Z is selected from COO, phenylene, CO,



R^2 is selected from the same radicals as R, R^5 is selected from unsaturated monovalent hydrocarbon radicals and unsaturated halogenated monovalent hydrocarbon radicals, G' is selected from hydrogen, R radicals and R^5 radicals, a varies from 1.95 to 2.01, inclusive, and heating the resulting mixture to a temperature in the range of 80°C to 650°C.

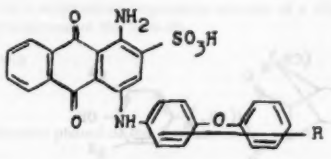
3,941,742
MASS COLORATION OF POLYAMIDES

Fritz Graser, Ludwigshafen, Germany, assignor to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Aug. 26, 1974, Ser. No. 500,637
Claims priority, application Germany, Sept. 7, 1973, 2345123
Int. Cl.² C09B 1/32
U.S. Cl. 260—37 NP **6 Claims**

1. A process for the mass coloration or dope dyeing of a polyamide which comprises:

coloring or dyeing chips or granules of the polyamide by dry dusting contact or by absorption from an aqueous liquor with a dye of the formula:



in which R is hydrogen or chloro; and

melting the colored polyamide granules or chips in dry form and processing the melt by extrusion into threads, filaments, wires, sheeting, film or the like.

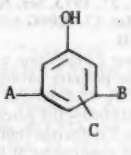
3,941,743
CAST METAL APPEARING METAL FILLED RESIN COMPOSITIONS

Michael J. Skubon, Strongsville, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Apr. 27, 1973, Ser. No. 355,124
Int. Cl.² C08K 3/08
U.S. Cl. 260—38 **2 Claims**

1. A process for preparing a cast metal appearing article which comprises:

A. providing a metal filled resin composition curable at room temperature and comprising a phenolic resin component, a hardener component, and a curing catalyst wherein said resin component is (a) an organic solvent soluble benzylic ether resin which contains benzylic ether group and which comprises a condensation polymer of a phenol having the general formula:



wherein A, B and C are hydrogen, hydrocarbon radicals, oxyhydrocarbon radicals or halogen, condensed with an aldehyde having the general formula R'CHO wherein R' is hydrogen or a hydrocarbon radical of one to eight carbon atoms in the presence of catalytic concentrations of a metal ion, or (b) a methylol-terminated phenolic resin which comprises a resole resin which is organic solvent soluble; said hardener component is liquid polyisocyanate containing at least two isocyanate groups; and is present in an amount equal to 10 to 500 weight percent based on the weight of the resin and said curing agent is a base having a pK_b value in the range of about 7 to about 11 and is present in an amount equal to 0.01 to 10.0 weight percent based on the weight of the resin and between about 20% to about 50% by weight of the composition of a metallic powder selected from the group consisting of copper, nickel, brass, bronze, iron, steel, and mixtures thereof, or from about 35% to about 45% by weight of aluminum powder, said powder having a particle size in the range of about 200 to 325 mesh, and having a general spherical shape;

B. adding said metal filled resin composition to a mold;

C. curing said metal filled resin composition in said mold;

D. stripping the cured and molded article from the mold; and

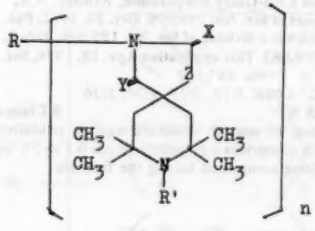
E. then polishing at least a portion of a surface of the cured article to increase the lustre of at least a portion of the article.

3,941,744
PIPERIDINE DERIVATIVES AND THEIR USE AS STABILIZERS

Keisuke Murayama; Syoji Morimura; Takao Yoshioka; Toshimasa Toda; Eiko Mori; Hideo Horiuchi; Susumu Higashida; Katsuaki Matsui; Tomoyuki Kurumada; Noriyuki Ohata, and Hisayou Ohsawa, all of Tokyo, Japan, assignors to Sankyo Company Limited, Japan

Division of Ser. No. 258,392, May 31, 1972, abandoned. This application Mar. 12, 1973, Ser. No. 339,772
Claims priority, application Japan, June 5, 1971, 46-39630
Int. Cl.² C08K 5/00
U.S. Cl. 260—45.8 N **24 Claims**

1. A synthetic polymer composition stabilized against photo- and thermal-deterioration wherein there is incorporated, in a sufficient amount to prevent said deterioration, a compound having the formula



(I)

wherein

R' represents an alkyl group, a substituted alkyl group, an acyl group, an alkoxycarbonyl group, a substituted alkoxycarbonyl group, an amino group, a substituted amino group or
nitroso group;

X represents oxygen atom or sulfur atom;

Y represents oxygen atom, sulfur atom or a group of the formula = N—R'' in which R'' is hydrogen atom, an alkyl group or a substituted alkyl group;

Z represents oxygen atom or a group of the formula > N—R)41 in which R''' is hydrogen atom, an alkyl group or a substituted alkyl group;

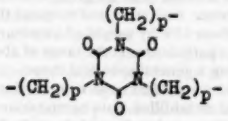
n is an integer of 1 through 4 inclusive; and

R represents, when *n* is 1, an alkyl group, a substituted alkyl group, an aryl group, a substituted aryl group, a cycloalkyl group, an alkoxycarbonyl group, a substituted alkoxy-

carbonyl group, a substituted phosphino group or a substituted phosphinyl group,

when *n* is 2, an alkylene group, an alkenylene group, an arylene group, a substituted arylene group, an aralkylene group, an alkylenediphenylene group, a bis-(acyloxyalkylene) group, an alkylenebis-(oxycarbonylalkyl) group, a dialkylene ether group or a diphenylene ether group,

when *n* is 3, an alkanetriyl group, a tris-(acyloxyalkylene) group, an alkane-tris-(oxycarbonylalkyl) group or a group of the group



in which *p* is an integer of 1 through 8 inclusive and *p's* may be the same or different, and,

when n is 4, an alkane tetrayl group, a tetrakis-(acyloxyalkylene) group or an alkanetetrakis(oxycarbonylalkyl) group.

3,941,745

SULFUR CONTAINING DERIVATIVES OF DIALKYL-4-HYDROXYPHENYLTRIAZINE

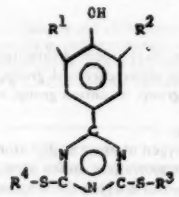
Martin Dexter, Briarcliff Manor; Martin Knell, Ossining, both of N.Y., and Heimo Brunetti, Reinach, Basel-Land, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 299,998, Oct. 24, 1972, Pat. No. 3,817,914, which is a division of Ser. No. 159,566, July 2, 1971, Pat. No. 3,709,883. This application Apr. 18, 1974, Ser. No. 462,145

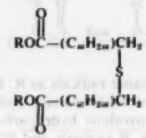
Int. Cl.² C08K *5/11, 5/13, 5/34, 5/36*

U.S. Cl. 260—45.8 NT **8 Claims**

1. A composition of matter stabilized against oxidative deterioration which comprises a polyolefin; from 0.1 to 5% by weight of a stabilizing compound having the formula



wherein each of R^1 and R^2 is a lower alkyl of 1 to 6 carbon atoms, R^3 is alkyl of 1 to 18 carbon atoms, and R^4 is hydrogen or alkyl of 1 to 18 carbon atoms; and from 0.5 to 2% by weight of a co-stabilizer of the formula



where R is alkyl of 6 to 24 carbon atoms and *m* is an integer from 1 to 6.

3,941,746

CONTAINING HINDERED PHENOLIC NORBORNANE-2,3-DICARBOXIMIDES STABILIZED COMPOSITIONS

John F. Stephen, New City, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 429,235, Dec. 28, 1973. This application May 30, 1975, Ser. No. 582,564

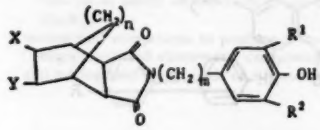
Int. Cl.² C08J *3/20*

U.S. Cl. 260—45.8 N **4 Claims**

1. A composition of matter comprising

a. an organic material normally subject to degradation,

b. from 0.01 to 5% of a stabilizer of the formula



I

wherein

R^1 and R^2 are the same or different (lower) alkyl groups of 1 to 4 carbon atoms,

X and Y are hydrogen or, when taken together, they form a bond or an ether linkage,

m has a value of 0 to 3, and

n has a value of 0 to 2.

c. from 0 to 5% of a UV absorber, and

d. from 0 to 5% of a co-stabilizer.

3,941,747

OLEFIN POLYMER COMPOSITIONS STABILIZED AGAINST DISCOLORATION

Clarence Edward Roth, Jr.; Joseph Arnold Lasswell; William Dennis Bybee, and Earl Brewer Parker, Jr., all of Orange, Tex., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Nov. 27, 1973, Ser. No. 419,240

Int. Cl.² C08G *6/00*

U.S. Cl. 260—45.95 H **4 Claims**

1. An olefin polymer composition consisting essentially of a normally solid olefin polymer having incorporated therein, on a weight basis, 0.001 – 0.2 percent of 2,6-di-tertiarybutyl-4-methylphenol and 0.0005 – 0.4 percent of 2,6-ditertiarybutyl-4-ethylphenol, the 2,6-ditertiarybutyl-4-ethylphenol being present in an amount constituting at least 50% by weight of the 2,6-ditertiarybutyl-4-methylphenol, said olefin polymer having polymerized therein at least 90 weight percent of a monoolefin of the group consisting of ethylene and propylene.

3,941,748

PROCESS FOR PREPARING AROMATIC POLYMERS IN PRESENCE OF ALKALI METAL FLUORIDE

Terence King, New Barnet, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 392,010, Aug. 27, 1973, abandoned, and a continuation of Ser. No. 169,858, Aug. 6, 1971, abandoned. This application Sept. 17, 1974, Ser. No. 506,846

Claims priority, application United Kingdom, Aug. 19, 1970, 29931/70; May 19, 1971, 155792/71

Int. Cl.² C08G 65/38, 65/40, 75/20

U.S. Cl. 260—47 R 14 Claims

1. A process for the preparation of an aromatic polymer consisting essentially of recurring units of the formula

—Ar-Q—

which comprises heating a reaction mixture consisting essentially of an alkali metal fluoride and (a) a halophenol having the formula

X-Ar-QH

and/or (b) a substantially equimolar mixture of a dihalobenzenoid compound of the formula

X-Ar-X

and a dihydric phenol of the formula

HQ-Ar-QH

in which formulae Ar and Q are respectively a bivalent aromatic residue and an oxygen or sulphur atom and may vary from unit to unit in the polymer chain and X is a halogen atom, and each atom X is activated by a single electron attracting group selected from the group consisting of —CO— and $-SO_2-$ in the associated aromatic residue Ar, the amount of alkali metal fluoride being such that the number of fluorine atoms present as alkali metal fluoride together with any of the atoms X in the halophenol X-Ar-QH and/or dihalobenzenoid compound X-Ar-X that are fluorine, in the reaction mixture is at least twice the number of —QH groups in the reaction mixture.

3,941,749

LINEAR OXADIAZOLE-IMIDE COPOLYMERS

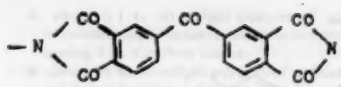
Lawrence W. Frost, Murrysville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

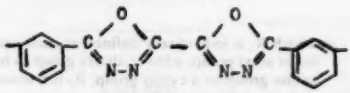
Continuation of Ser. No. 405,573, Oct. 21, 1964, abandoned. This application Oct. 23, 1973, Ser. No. 408,891

Int. Cl.² C08G 73/10, 73/14

U.S. Cl. 260—65 6 Claims

3. A substantially insoluble and infusible oxadiazole-imide copolymer consisting essentially of the repeating unit





3,941,750

POLYVINYLPYRENAL—AN INTRINSIC PHOTOCONDUCTOR AND ACTIVE MATRIX POLYMER

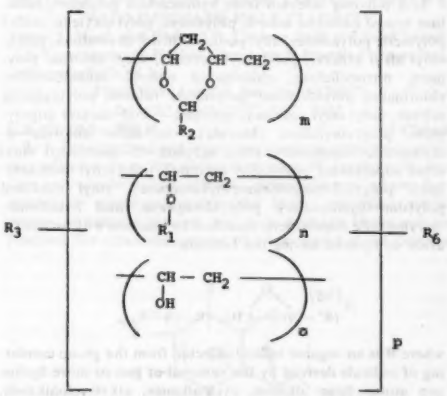
William W. Limburg, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 393,082, Aug. 30, 1973, Pat. No. 3,884,689. This application Sept. 19, 1974, Ser. No. 507,307

Int. Cl.² C08G 10/06; G03G 1/68

U.S. Cl. 260—73 R 8 Claims

1. An aromatic polyvinyl polymer represented by the formula

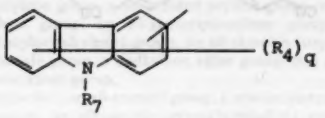


wherein

R_1 is defined as a hydrogen atom, a lower alkyl group or as a lower alkyl carbonyl group;

R_2 is an aromatic polycyclic radical having 4–5 fused ring nuclei or a 3 ringed N-containing heterocyclic group of

the formula



in which R_4 is individually defined at each occurrence as a lower alkyl group, a lower alkoxy group, a halo group, an amino group or a cyano group, R_7 is a lower alkyl group and q is defined as 0–2;

R_3 and R_6 are polymeric end groups; and

m, n, o and p are positive numbers commensurate with a number average molecular weight of at least about 5,000; m, n and o falling with the respective ratios of about 1–6:0–1:1–8 in random or block polymers.

3,941,751
EPOXY-AZIDO COMPOUNDS

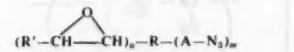
David S. Breslow, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 301,003, Oct. 26, 1972, abandoned, which is a division of Ser. No. 85,300, Oct. 29, 1970, abandoned, which is a division of Ser. No. 843,230, July 18, 1969, Pat. No. 3,608,604. This application Mar. 6, 1974, Ser. No. 448,612

Int. Cl.² C08G *63/76*

U.S. Cl. 260—75 T **10 Claims**

1. A polymer selected from hydrocarbon polymers, cellulose esters, cellulose ethers, polyesters, poly(alkylene oxide) polymers, polyamides, allyl pentaerythritol derivatives, poly(-vinyl alkyl ethers), poly(vinyl acetals), vinyl chloride polymers, nitrocellulose, chlorinated natural rubber, sulfochlorinated polyethylene; polysulfide rubber, polyurethane rubber, poly(vinyl acetate), ethylene—vinyl acetate copolymers, poly(vinylidene chloride), vinylidene chloride—acrylonitrile copolymers, ethyl acrylate—2-chloroethyl vinyl ether copolymers, poly(ethyl acrylate), poly(ethyl methacrylate), poly[3,3-bis(chloromethyl)oxetane], vinyl modified poly(dimethylsiloxane), polychloroprene, and butadiene--acrylonitrile copolymers, modified by reaction with an epoxy-azido compound having the formula



where R is an organic radical selected from the group consisting of radicals derived by the removal of two or more hydrogen atoms from alkanes, cycloalkanes, alkylcycloalkanes, arenes, alkyl substituted arenes, alkylene-diarenes, dialkylcycloalkanes, alkyloxyalkanes, aryloxyarenes, alkaryloxyarenes, alkaryloxyalkarenes, aralkyloxyalkanes, aralkyloxyaralkanes, alkylthioalkanes, arylthioarenes, alkarylthioarenes, alkarylthioalkarenes, aralkylthioalkanes, aralkylthioaralkanes, alkylsulfonylalkanes, arylsulfonylarenes, alkarylsulfonylarenes, alkarylsulfonylalkarenes, aralkylsulfonylalkanes, aralkylsulfonylaralkanes, and the foregoing radicals with fluoro, chloro, bromo or iodo substituents, R′ is a radical selected from the group consisting of hydrogen, alkyl, cycloalkyl, aryl, and aralkyl radicals, A is a radical selected from the group consisting of

and $-SO_2-$ and n and m are integers from 1 to 10.

3,941,752
FLAME RETARDING LINEAR POLYESTERS AND SHAPED ARTICLES THEREOF

Hans-Jerg Kleiner, Bad Soden, Taunus; Manfred Finke, Fischbach, Taunus; Ulrich Bollert, Diedenbergen, Taunus, and Walter Herwig, Neuenhain, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

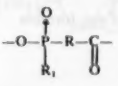
Filed Sept. 13, 1974, Ser. No. 505,686

Claims priority, application Germany, Sept. 17, 1973, 2346787

Int. Cl.² C08G *63/18*

U.S. Cl. 260—75 P **8 Claims**

1. A linear polyester which is the polycondensation product of a dicarboxylic acid, a diol and a flame-retarding carboxyphosphinic acid monomer, said monomer being used in an amount of from 3 to 20 mol percent, based on the total amount of dicarboxylic acid and monomer, said monomer being a source of structural units in said polyester of the formula



wherein R is saturated, open-chain or cyclic alkylene, arylene or aralkylene having one to 15 carbon atoms, and may contain one or more hetero atoms selected from F, Cl, Br, O and S, and R_1 is alkyl having up to six carbon atoms, aryl, or aralkyl and may contain one or more hetero atoms selected from F, Cl, Br, O and S, provided that in the R and R_1 groups the O, if present, is the oxygen of an ether group, and the S, if present, is the sulfur of a thioether, sulfoxide, sulfone or sulfonate group.

3,941,753
PREPOLYMERS OF POLYISOCYANATES WITH HYDROXY-ENAMINES OR HYDROXY-KETIMINES

Bernd Brinkmann, Bad Zwischenahn, and Eugen Griebsch, Unna, both of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Germany

Continuation-in-part of Ser. No. 240,762, April 3, 1972, Pat. No. 3,865,791. This application Nov. 1, 1974, Ser. No. 520,356

Claims priority, application Germany, Nov. 10, 1973, 2356213; Apr. 6, 1971, 2116882

Int. Cl.² C08G *18/02*

U.S. Cl. 260—77.5 MA **3 Claims**

1. A prepolymer, free of isocyanate groups and containing an enamine or ketimine group, prepared by reacting a polyisocyanate and an enamine or ketimine having at least one hydroxy group in an amount such that the ratio NCO/OH is 1.

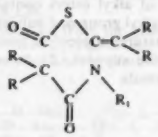
3,941,754

PREPARING POLYAMIDES BY ANIONIC POLYMERIZATION OF LACTAMS

Zbynek Bukac, and Jan Sebenda, both of Prague, Czechoslovakia, assignors to Ceskoslovenska Akademie Ved, Prague, Czechoslovakia

Division of Ser. No. 275,155, July 26, 1972, Pat. No. 3,843,608. This application May 15, 1974, Ser. No. 470,007
Claims priority, application Czechoslovakia, July 27, 1971, 5478-71; July 27, 1971, 5481-71
Int. Cl.² C08G 69/24, 69/20
U.S. Cl. 260—78 L 1 Claim

1. The method of preparing solid polyamides by anionic polymerization of cyclic lactams containing at least 4 atoms in a ring which comprises polymerization of at least one such lactam in the presence of a cocatalyst having the formula



wherein R is alkyl having 1 to 18 carbon atoms, alkenyl having 1 to 18 carbon atomes or arloweralkyl, R_1 is R, aryl, diloweralkylaminoaryl, lower arkoxyaryl.

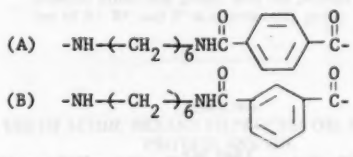
3,941,755

FIBER-FORMING 6TA/6IA COPOLYMERS

Richard D. Chapman; Donald A. Holmer; Oscar A. Pickett, Jr., and James H. Saunders, all of Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 378,463, July 12, 1973, abandoned, which is a division of Ser. No. 216,206, Jan. 7, 1972, abandoned. This application Nov. 15, 1974, Ser. No. 524,165
Int. Cl.² C08G 69/26
U.S. Cl. 260—78 R 4 Claims

1. A fiber-forming copolymer consisting essentially of recurring units of the formulas:



wherein the mole ratio of units A to B is between about 60:40 to about 80:20 and wherein said copolymer in fiber form has a boiling water shrinkage between 10 and 30%.

3,941,756

WATER-INSOLUBLE PREPARATIONS OF PEPTIDE MATERIALS, THEIR PRODUCTION AND THEIR USE

Fritz Hüper; Erich Rauenbusch; Günter Schmidt-Kastner, all of Wuppertal; Bruno Bömer, Leverkusen, and Herbert Barti, Odenthal-Hahnenberg, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 345,452, March 27, 1973, Pat. No. 3,871,964. This application June 20, 1974, Ser. No. 481,225
Claims priority, application Germany, Mar. 20, 1972, 2215687
Int. Cl.² C08F 220/20, 222/04
U.S. Cl. 260—78.5 R 2 Claims

1. A crosslinked copolymer comprising the following copolymerized units:

A. about 0.1 to 30 weight percent of at least one α,β-monoolefinically unsaturated dicarboxylic acid anhydride having 4 to 9 carbon atoms;

B. about 35 to 90 weight percent of at least one di- and/or poly(meth)acrylate of a diol and/or a polyol; and

C. about 5 to 60 weight percent of at least one hydrophilic monomer containing a carboxyl, aminocarbonyl, sulfo or sulfamoyl group.

3,941,757

METHOD FOR PRODUCTION OF COPOLYMER OF CYCLOPENTENE

Hiroshi Wakabayashi; Toru Nakagawa; Shoichi Matsumura, and Shigeru Fujii, all of Kobe, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed July 31, 1974, Ser. No. 493,387
Claims priority, application Japan, July 31, 1973, 48-86502
Int. Cl.² C08F 2/06, 4/14, 4/22, 232/08
U.S. Cl. 260—80.78 11 Claims

1. Method of producing a copolymer of cyclopentene comprising the steps of

preliminarily mixing in an inert solvent a polycyclic olefin and a catalyst comprising at least tungsten or molybdenum compound, to form a complex compound;

polymerizing cyclopentene in an inert solvent containing a catalyst comprising at least tungsten or molybdenum compound and an organometallic compound; and

adding said complex compound to the polymerizing cyclopentene.

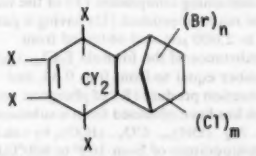
3,941,758

HALOGEN CONTAINING FIRE RETARDANT ADDITIVE WITH IMPROVED HEAT STABILITY

James J. Maul, and Richard D. Carlson, both of Grand Island, N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Mar. 4, 1974, Ser. No. 447,807
Int. Cl.² C08K 3/22, 5/02, 5/06
U.S. Cl. 260—880 R 20 Claims

1. A fire retardant polymeric composition comprising polymer selected from the group consisting of acrylonitrile-styrene-polybutadiene copolymers, polyurethanes, amino-formaldehyde resins and polyamides having recurring amide groups as integral parts of the main polymer chain and an effective fire retardant amount of a compound of the formula



wherein X is a halogen selected from the group consisting of fluorine, chlorine and bromine, Y is independently selected from the group consisting of fluorine, chlorine, bromine, alkyl of 1 to 10 carbon atoms, alkyloxy wherein the alkyl group contains 1 to 10 carbon atoms, haloalkyl and haloalkyloxy wherein said alkyl groups contain from 1 to 10 carbon atoms and said halo is fluoro, chloro or bromo, n has an average value from 0 to 6 and m has an average value from 0 to 6 and the total of n plus m has an average value from 1 to 6.

3,941,759
DEGRADABLE PLASTICS CONTAINING DUAL-FUNCTION ADDITIVE SYSTEM

Lynn J. Taylor, Toledo, and John W. Tobias, Perrysburg, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Continuation-in-part of Ser. Nos. 230,969, March 1, 1972, and Ser. No. 301,199, Oct. 26, 1972, and Ser. No. 206,144, Dec. 8, 1971, Pat. No. 3,797,690. This application Oct. 23, 1973, Ser. No. 408,336

Int. Cl.[2] C08F *8/50*; C08J *3/00*

U.S. Cl. 260—92.8 A **8 Claims**

1. As a composition of matter, an organic polymeric material containing a degradation-controlling amount of an additive system consisting essentially of at least one organic photosensitizer selected from the group consisting of anthraquinone, 1-aminoanthraquinone, 2-aminoanthraquinone, 1-chloroanthraquinone, 2-chloroanthraquinone, 1-methyl anthraquinone, 2-methyl anthraquinone, 2-ethyl anthraquinone, 2-tert-butyl anthraquinone, 1-nitroanthraquinone, 2-phenylanthraquinone, 1,2-naphthoquinone, 1,4-naphthoquinone, 2-methyl-1,4-naphthoquinone, 1,2-benzanthraquinone, 2,3-benzanthraquinone and phenanthrenequinone and at least one transition metal dialkyldithiocarbamate.

3,941,760
MANUFACTURE OF PARTICULATE HOMOPOLYMERS OR COPOLYMERS OF ETHYLENE

Rudolf Herbeck, Frankenthal; Erich Kolk, Bad Durkheim; Guenther Schweier, Ludwigshafen; Hans Schick, Mannheim, and Friedrich Urban, Limburgerhof, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed June 13, 1974, Ser. No. 478,864

Claims priority, application Germany, June 19, 1973, 2331103

Int. Cl.[2] C08F *4/02*, *10/02*

U.S. Cl. 260—94.9 C **2 Claims**

1. A process for the manufacture of particulate ethylene homopolymers (HP) or ethylene copolymers (CP) containing up to 20% by weight of polymerized units of C_{3-8} α-monoalkene, which polymers have a particle size of from 0.1 to 6 mm and are obtained by polymerization of ethylene or ethylene/C_{3-8} α-monoalkene mixtures in a dry, agitated bed (B) of particulate homopolymer (HP) or copolymer (CP) at temperatures of from 30° to 120°C and pressures of from 1×10^5 to 2×10^7 N/m² (Pascal) by means of a Ziegler/Natta catalyst system consisting of (1) a titanium-containing component and (2) an aluminum (C_{1-8} trialkyl) or aluminum (C_{1-8} dialkyl) chloride, provided that (I) the components (1) and (2) of the catalyst system are separately fed to the bed (B) and (II) the atomic ratio of titanium in component (1) to aluminum in component (2) is from 1:0.1 to 1:1,000, wherein the titanium-containing component (1) of the catalyst system is a particulate reaction product (U) having a particle diameter of from 0.1 to 2,000 μm and obtained from

1.1. a substance of the formula $TiCl_3 \cdot (AlCl_3)_n$, where n is a number equal to from 0 to 0.34, and

1.2. a reaction product (R) of phosgene and a substance (S) which has been obtained from a substance of the formula $Mg_6 \cdot Al_2 \cdot (OH)_{16} \cdot CO_3 \cdot (H_2O)_4$ by calcination (heating) at a temperature of from 100° to 600°C for from 1 to 100 hours,

provided that (III) the reaction product (R) has been obtained by allowing phosgene to act on the substance (S) at a temperature of from 80° to 350°C until the reaction product (R) has a chlorine content of from about 50 to 65% by weight and (IV) the reaction product (U) has been obtained by milling its components (1.1) and (1.2) together in a vibratory ball mill in a ratio of from 1:2 to 1:200 by weight over a period of time ranging from 5 to 100 hours, the milling acceleration being from 4 to 6 m/s².

3,941,761
METHOD OF POLYMERIZING OLEFINS

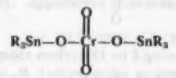
Thomas J. Pullukat, Hoffman Estates; Mitsuzo Shida, and Robert L. Gillilan, both of Barrington, all of Ill., assignors to Chemplex Company, Rolling Meadows, Ill., a part interest

Division of Ser. No. 439,248, Feb. 4, 1974, Pat. No. 3,884,832. This application Dec. 23, 1974, Ser. No. 535,190

Int. Cl.[2] C08F *4/02*, *10/02*

U.S. Cl. 260—94.9 D **12 Claims**

1. The method of making polymers from polymerizable 1-olefins which comprises polymerizing at least one of said olefins under polymerizing conditions with a catalyst system consisting essentially of the reaction product prepared by reacting together at an elevated temperature (1) a support which is a finely divided insoluble inorganic support material of the class consisting of silica, alumina, zirconia and mixtures thereof modified by reacting said support with a compound of the class consisting of alkyl esters containing 1 to about 7 carbon atoms in the alkyl group and halides of titanium, zirconium, nickel and mixtures thereof in amounts to give about 0.5–10% metal on the support (2) an organotin chromate essentially of the formula



and (3) a cocatalytic amount of an alkyl aluminum compound of the formula R_aAlX_b in each of which formula each R is an individually selected hydrocarbon radical containing from 1 to about 14 carbon atoms, X is a member of the class consisting of halogen, hydrogen and alkoxy, a is an integer from 1 to 3 inclusive and b is an integer from 0 to 2 inclusive, with the sum of a and b being 3, the said system having an aluminum-chromium ratio of at least 2 to 1.

3,941,762
O-ACYL DERIVATIVES OF ANTIBIOTIC EM-49

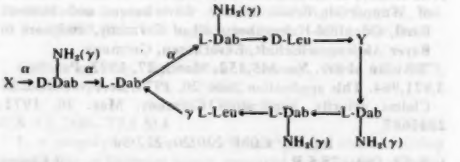
William Lawrence Parker, Pennington, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 357,735, May 7, 1973, abandoned. This application July 8, 1974, Ser. No. 486,557

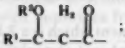
Int. Cl.[2] C07C *103/52*; C08H *1/00*; C12B *1/00*

U.S. Cl. 260—112.5 R **33 Claims**

8. A compound of the formula



wherein Dab is 2,4-diaminobutyric acid, Y is L-leucine or L-phenylalanine; X is



R^1 is C_7H_{15} or C_8H_{17}; and R^2 is lower alkanoyl, and acid salts thereof.

3,941,763

PGLU-D-MET-TRP-SER-TYR-D-ALA-LEU-ARG-PRO-GLY-NH_2 AND INTERMEDIATES

Dimitrios Sarantakis, West Chester, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Mar. 28, 1975, Ser. No. 563,258

Int. Cl.² C07C *103/52;* **A61K** *37/00*

U.S. Cl. 260—112.5 LH **8 Claims**

1. A compound selected from the group consisting of

L—P—Glu—D—Met—L—Trp—L—Ser—L—Tyr—
—Ala—L—Leu—L—Arg—L—Pro—Gly—NH_2

and

R^4—L—p—Glu—D—Met—L—Trp—L—Ser(R^2)—
—Tyr—(R^2)—D—Ala—L—Leu—L—Arg(-
N^G—R^1)—L—Pro—Gly—R

or a non-toxic salt thereof; wherein

R is selected from the class consisting of NH_2, OH, O-(lower)alkyl and O-benzyl;

R^1 is selected from the class consisting of hydrogen and a protecting group for the N^δ, N^ω, and $N^{\omega'}$ nitrogen atoms of arginine selected from nitro, tosyl, benzyloxy-carbonyl and adamantyloxycarbonyl;

R^2 is selected from the class consisting of hydrogen and a protecting group for the phenolic hydroxyl group of tyrosine selected from tert-butyl, tetrahydropyranyl, trityl, benzyl, 2,6-dichlorobenzyl, benzyloxycarbonyl and 4-bromobenzyloxycarbonyl;

R^3 is selected from the class consisting of hydrogen and a protecting group for the alcoholic hydroxyl group of serine and is selected from acetyl, benzoyl, tetrahydropyranyl, tertbutyl, trityl, 2,6-dichlorobenzyl, benzyl and benzyloxycarbonyl;

R^4 is selected from the class consisting of hydrogen and an α-amino protecting group; with the proviso that at least one of R^1, R^2, and R^3 is a protecting group.

3,941,764

USE OF ACIDIC HEXANE TO PROCESS OIL SEEDS FOR PROTEIN AND OIL

Thomas P. Hensarling; Thomas J. Jacks, both of Metairie, and Lawrence Y. Yatsu, New Orleans, all of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed May 10, 1974, Ser. No. 468,951

Int. Cl.² A23J *1/14;* **C07G** *7/00;* **C11B** *1/04;* **A23J** *7/02*

U.S. Cl. 260—123.5 **2 Claims**

1. A process for preparing protein and oil from oilseeds, the process comprising:

a. preparing a homogeneous, monophasic mixture comprising hexane and about from 2% to 25% acetic acid,

b. adding about from 3 ml to 12 ml of the mixture of (a) per 1 gram of comminuted oilseeds,

c. stirring the mixture of (b) at room temperature for about from 2 minutes to 4 hours to insure contact of mixture (a) with the comminuted oilseed particles, thereby forming a suspension of marc in an oil-containing, homogeneous, monophasic miscella, and

d. separating the miscella from the marc produced in step (c), thereby obtaining the proteinaceous marc and the oil-containing, homogeneous, monophasic miscella.

3,941,765

PROCESS FOR THE MANUFACTURE OF SYMMETRIC 1:2 CHROMIUM COMPLEXES OF AZO DYES

Christian Wittwer, Bottmingen, and Emil Bonometti, Basel, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Jan. 10, 1974, Ser. No. 433,012

Claims priority, application Switzerland, Jan. 18, 1973, 690/73

Int. Cl.² C09B *45/06, 45/16*

U.S. Cl. 260—151 **5 Claims**

1. In a process for the manufacture of 1:2 chromium complexes of metallisable azo dyes, wherein the azo dyes are treated in aqueous solution at pH 7 to 9 with at least the stoichiometric amount of chromium oxalate solution, the improvement comprising acidifying the reaction medium during the course of the chroming once or repeatedly to a pH of 6 or less to reactivate precipitated chromium compounds and readjusting the pH to pH 7 to 9 to complete the metallization process.

3,941,766

AZO COMPOUNDS FROM PIGMENTS OF A HETEROCYCLIC-SUBSTITUTED ANILINE COUPLED TO A 2,6-DIHYDROXY-4-METHYL-3-CYANO OR -3-CARBAMOYLPYRIDINE

Peter Dimroth, Ludwigshafen, and Walter Dammert, Frankenthal, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

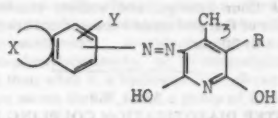
Filed Jan. 7, 1974, Ser. No. 431,579

Claims priority, application Germany, Jan. 10, 1973, 2300940

Int. Cl.² C09B *29/36*

U.S. Cl. 260—155 **4 Claims**

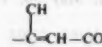
1. An azo pigment having the formula



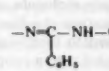
in which

R is cyano or carbamoyl,

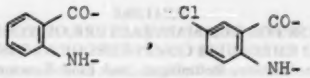
X is



—CO—NH—CO—NH—, —CO—NH—CH=N—,



—CO—NH—CH_2—, —NH—CO—NH—, —NH—CO—CO—NH—, —O—CO—CO—NH—, —O—CO—NH—, —CO—NH—CO—,



or —CO—NH—SO_2—NH—, and
Y is hydrogen, chlorine, bromine, methyl, methoxy or ethoxy.

3,941,767
METHOD OF PREPARING POWDERED ELASTOMER COMPOSITIONS

Thomas P. Abbott, Peoria, Ill., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed May 5, 1975, Ser. No. 574,677
Int. Cl.² C08L *3/04, 3/06*
U.S. Cl. 260—17.2 6 Claims

1. In a process for preparing powdered elastomer compositions having the following steps:
   a. coprecipitating from 3 to 19 parts of a first encasement compound selected from the group consisting of starch xanthate and zinc starch xanthate having xanthate degrees of substitution of from 0.2 to 3.0, cationic starch, and their cereal flour analogs with 100 parts of latex solids contained in a latex selected from the group consisting of natural rubber latex, chloroprene latex, polybutadiene latex, styrenebutadiene rubber latex, butadiene-acrylonitrile rubber latex, oil-extended styrene-butadiene rubber latex, and phenol-formaldehyde-extended nitrile rubber latex to form a coprecipitate having a particle diameter of about 1 mm.;
   b. filtering and water washing the coprecipitate resulting from (a);
   c. washing the coprecipitate resulting from step (b) with a water-miscible solvent;
   d. filtering the washed coprecipitate resulting from step (c); and
   e. repeating steps (c) and (d) until the filtrate resulting from step (d) contains from 0 to 10 percent water; an improvement comprising, as an additional step prior to step (c), supra, resuspending the coprecipitate resulting from step (b), supra, in water and precipitating, in the presence of the resuspended coprecipitate, from 1 to 17 parts per 100 parts of latex solids (phr) of a second encasement compound selected from the group consisting of starch xanthate and zinc starch xanthate having xanthate degrees of substitution of from 0.2 to 3.0, cationic starch, their cereal flour analogs, and sodium stearate, the total amount of first and second encasement compounds being from 4 to 20 phr.

3,941,768
ONE STEP DIAZOTIZATION COUPLING PROCESS

Emil Stocker, Riehen, Basel, Switzerland, assignor to Ciba-Geigy AG, Switzerland

Continuation of Ser. No. 827,933, May 26, 1969, abandoned.
This application Mar. 2, 1972, Ser. No. 231,366
Claims priority, application Switzerland, May 30, 1968, 8029/68
Int. Cl.² C07C *107/04*; C09B *29/00, 31/02, 35/02*
U.S. Cl. 260—184 10 Claims

1. In a process for the preparation of a metal free azo pigment having at least two -CONH- groups per molecule and a molecular weight of at least 500, by diazotization of a diazotizable amino benzene with a diazotizing agent to form a diazo compound and coupling said diazo compound with a coupling compound, the improvement wherein the diazotization and coupling are performed in a simple operation without separation of the diazo compound, said process comprising admixing:
   a. a diazotizable amino benzene having no sulphonic acid groups
   b. a coupling component which is a 2-hydroxy-naphthalene-3-carboxylic acid phenyl or naphthyl amide, said component having no sulphonic acid groups, active methylene or tertiary nitrogen groups, and
   c. a diazotizing agent selected from the group consisting of alkyl nitrite, dinitrogen tetroxide, dinitrogen trioxide, nitrosyl chloride, nitrosyl bromide and sodium nitrite
   in an organic liquid selected from the group consisting of liquid aromatic hydrocarbons or liquid aromatic hydrocarbons which are substituted by halo, nitro or lower alkyl, said solvent containing at most 10% water,
   the amount of said organic liquid being such that a substantial portion either of the diazo component or of the said coupling component, or of both these reactants remains undissolved therein.

3,941,769
PROCESS FOR THE PREPARATION OF SACCHAROSE-YDROXY ALKYL ETHERS

Dieter Maassen; Roland Nast; Heinrich Bormann, all of Dormagen; Helmut Piechota, Leverkusen, all of Germany, and Karl-Josef Kraft, Cora Opolis, Pa., assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 9, 1973, Ser. No. 387,067
Claims priority, application Germany, Aug. 22, 1972, 2241242
Int. Cl.² C07H *15/08*
U.S. Cl. 260—209 R 8 Claims

1. In a process for the preparation of saccharose-hydroxyalkyl ethers by the alkoxylation of saccharose with alkylene oxides selected from the group consisting of ethylene oxide, propylene oxide and 1,2-butylene oxide at a temperature of 85° to 130°C and a pressure of 1.3 to 5.0 atmospheres the improvement comprising reacting the alkylene oxides with a mixture containing
   a. 100 parts by weight of saccharose,
   b. 2–5 parts by weight of water,
   c. 3–15 parts by weight of a low molecular weight higher valent alcohol, momoamine, or polyamine or any mixture of these wherein the alcohol, monoamine, or polyamine is water soluble, has a melting point below 100°C and a molecular weight of between 60 and 250,
   d. 40–150 parts by weight of an aromatic hydrocarbon solvent, and
   e. 1–5 parts by weight of an alkali metal hydroxide, wherein said mixture is initially prepared at temperatures of between 20° and 100°C.

3,941,770
METHOD FOR PURIFYING 3′,5′-CYCLIC-ADENYLIC ACID OR 3′,5′-CYCLIC-DEOXYADENYLIC ACID

Jiro Ishiyama, Noda; Tamotsu Yokotsuka, Nagareyama; Motohiko Kato; Nobuyuki Yamaji, both of Noda, and Fumihiko Yoshida, Matsudo, all of Japan, assignors to Kikkoman Shoyu Co., Ltd., Noda, Japan

Filed Dec. 6, 1973, Ser. No. 422,566
Claims priority, application Japan, Dec. 7, 1972, 47-122038
Int. Cl.² C07H *19/20*
U.S. Cl. 260—211.5 R 17 Claims

1. A method for purifying 3′, 5′-cyclicadenylic acid or 3′, 5′-cyclic-deoxyadenylic acid comprising treating an aqueous solution containing 3′, 5′-cyclic-adenylic acid or 3′, 5′-cyclic-deoxyadenylic acid and impurities selected from the group consisting of nucleotides other than 3′, 5′-cyclic-adenylic acid and 3′, 5′-cyclic-deoxyadenylic acid, nucleosides, nucleobases, colored substances, proteins, and mixtures thereof by adjusting the pH to pH 5 or more, and adding a water-soluble organic solvent, said solvent being added in an amount sufficient to separate out or precipitate said impurities at said pH 5 or more while maintaining 3′, 5′-cyclic-adenylic acid or 3′,

5'-cyclic-deoxyadenylic acid in solution, and removing the separated or precipitated impurities from said solution.

3,941,771

DEXTRIN CARBOXYLATES AND THEIR USE AS DETERGENT BUILDERS

Joseph H. Finley, Metuchen, N.J., assignor to FMC Corporation, Princeton, N.J.

Filed Aug. 22, 1973, Ser. No. 390,524

Int. Cl.² C08B *31/02*

U.S. Cl. 260—233.5 **4 Claims**

1. A dextrin carboxylate comprising a dextrinized starch of about 20 to about 100 anhydroglucose units wherein from about 2.2 to about 2.8 average OH groups per anhydroglucose unit are esterified through one of the carboxyls of a non-aromatic polycarboxylic acid of 2–4 carboxyls containing 2 to 10 carbon atoms and the water-soluble salts thereof.

3,941,772

AZACYCLOALKANE-2,2-DIPHOSPHONIC ACIDS

Walter Ploger, Hilden, Rhineland; Manfred Schmidt-Dunker, Dusseldorf, and Christian Gloxhuber, Haan, Rhineland, all of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf-Holthausen, Germany

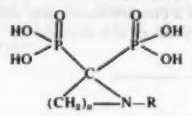
Filed Aug. 20, 1974, Ser. No. 499,000

Claims priority, application Germany, Aug. 27, 1973, 2343196

Int. Cl.² C07F *9/38*

U.S. Cl. 260—239 B **8 Claims**

1. An azacycloalkane-2,2-diphosphonic compound selected from the group consisting of (A) a compound of the formula



wherein R is selected from the group consisting of hydrogen and alkyl having 1 to 3 carbon atoms, and *n* is an integer from 3 to 5; and (B) a non-toxic, pharmacologically-acceptable water-soluble salt thereof.

3,941,773

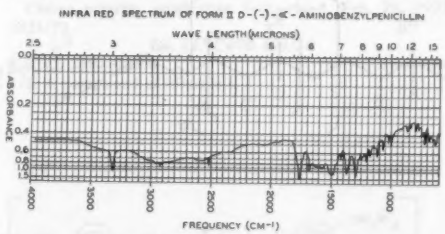
FORM II AMPICILLIN

Herbert H. Silvestri, DeWitt, and David A. Johnson, Fayetteville, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 233,943, Oct. 29, 1962, Pat. No. 3,180,862. This application Nov. 2, 1964, Ser. No. 408,191

Int. Cl.² C07D *499/44*

U.S. Cl. 260—239.1 **2 Claims**



1. A new crystalline form of D-6-(2-amino-2-phenyl-acetamido)penicillanic acid characterized by being substantially free of water in the chemically bound state, having a molecular weight of about 349, having an infrared spectrograph as disclosed in FIG. 1 of the drawings, and possessing substantially greater storage stability than hydrated crystalline D-6-(2-amino-2-phenyl-acetamido)penicillanic acid.

3,941,774

AMINOALKYL ESTERS OF PENICILLINS

John Peter Clayton; Kenneth David Hardy, and Angela Wendy Capel Guest, all of Horsham, England, assignors to Beecham Group Limited, Great Britain

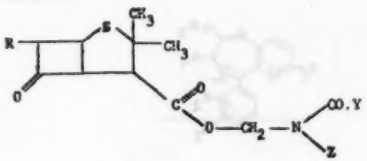
Filed May 21, 1973, Ser. No. 362,550

Claims priority, application United Kingdom, May 25, 1972, 24668/72; Dec. 5, 1972, 56003/72

Int. Cl.² C07D *499/44, 501/20*

U.S. Cl. 260—239.1 **8 Claims**

1. A compound of formula (I) or a pharmaceutically acceptable acid-addition salt thereof which contains a basic nitrogen atom:



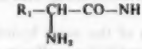
(I)

wherein

Y is alkyl of one to six carbon atoms, phenyl, benzyl, alkoxy of one to six carbon atoms, or benzyloxy;

Z is alkyl of one to six carbon atoms, phenylbenzyl, alkoxy of one to six carbon atoms, cyclopentyl, cyclohexyl and phenyl, or Y+Z taken together are a 3-benzoxazolidine ring;

R is phenylacetamido, 2- or 3-thienylacetamido, phenoxyacetamido, α-amino-phenylacetamido, α-amino-2- or 3-thienylacetamido, α-carboxyphenylacetamido, α-sulphophenyl-acetamido, α-azidophenylacetamido, α-guanidino-phenylacetamido, or N-tetrazolylacetamido, provided that: when Z is hydrogen, Y is alkoxy of one to six carbon atoms then R is not a group of formula (IV):



(IV)

in which R_1 is C_{2-7} alkyl, phenyl, or furyl.

3,941,775

6-AZA-3H-1,4-BENZODIAZEPINES

Walter von Bebenburg, Buchschlag, and Heribert Offermanns, Grossauheim, both of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Germany

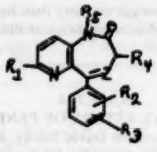
Filed Apr. 12, 1974, Ser. No. 460,525

Claims priority, application Austria, Apr. 27, 1973, 3772/73

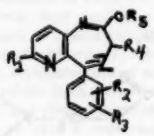
Int. Cl.² C07D *471/04*

U.S. Cl. 260—239.3 B **11 Claims**

1. A compound of the formula



wherein R_1 is the group $-NR_aR_b$ or $-N^+R_aR_bR_c\ X-$;
where R_1 is $-NR_aR_b$ and R_a and R_b are hydrogen, alkyl of 1 to 6 carbon atoms, hydroxyalkyl of 1 to 6 carbon atoms, alkanoyl of 2 to 6 carbon atoms or benzyl or $-NR_aR_b$ is morpholino, pyrrolidino, piperidino, piperazino or homopiperidino; when R_1 is $-N^+R_aR_bR_c\ X^-$ R_a, R_b and R_c are all alkyl of 1 to 6 carbon atoms and X^- is a halide, sulfate, acetate, citrate or p-toluene sulfonate;
R_2 and R_3 are hydrogen, halogen, trifluoromethyl, nitro, nitrile, hydroxy, lower alkyl or lower alkoxy;
R_4 is hydrogen;
Z is a nitrogen atom or the NO group; R_5 is hydrogen, lower alkyl or lower alkenyl;
or a pharmaceutically acceptable acid addition salt thereof;
or a tautomeric form of the formula



wherein R_1, R_2, R_3, R_4, and R_5 are as defined above or a pharmaceutically acceptable acid addition salt thereof.

3,941,776

RESOLUTION/RACEMIZATION OF AMINOLACTAM COMPOUNDS

Stylianos Sifniades, Madison; William J. Boyle, Jr., Morristown, and Jan F. Van Peppen, Chester, all of N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Filed July 1, 1974, Ser. No. 484,529
Int. Cl.² C07D *223/10, 223/12*
U.S. Cl. 260—239.3 R **21 Claims**

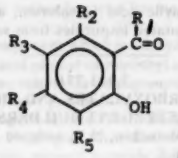
1. A process for effecting transformation of a D,L-aminocaprolactam compound selected from the group consisting of

A. the D,L-aminocaprolactam complexes, (tris-aminocaprolactam)nickel (II) salts and (tris-aminocaprolactam)-cobalt(II) salts,

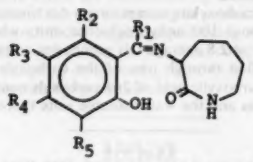
B. the D,L-aminocaprolactam salts of the acids hydrogen chloride, hydrogen bromide, β-naphthalenesulfonic acid and 2-naphthylamine-1-sulfonic acid, and

C. the D,L-aminocaprolactam diastereomeric salts of the acids L-pyrrolidonecarboxylic acid, D-N-carbamoylvaline, L-N-p-nitrobenzoylglutamic acid, L-N-benzoylglutamic acid, L-N-p-toluylglutamic acid and L-N-p-chlorobenzoylglutamic acid, to the desired isomer of said aminocaprolactam compound which comprises

a. forming a supersaturated feed solution of said D,L-aminocaprolactam compound in an inert solvent; said solution also containing D,L-aminocaprolactam, and a strong base when said D,L-aminocaprolactam compound is a complex, and, when said D,L-aminocaprolactam compound is a salt or diastereomeric salt, a compound of the formula I or II



(I)



(II)

wherein R_1 is hydrogen or methyl and R_2 through R_5 are hydrogen, nitro, halogen, cyano or carboxylic substituents, and a metal ion selected from the group consisting of Fe^{2+}, Fe^{3+}, Al^{3+}, Cu^{2+}, Co^{2+}, $Zn^{2+}$and Ni^{2+}, and maintaining said solution at a temperature of below 120°C.;

b. contacting said solution with seed crystals of the desired isomer of said aminocaprolactam compound, said contact being optional in the case that said aminocaprolactam compound is a diastereomeric salt; and

c. removing the grown crystals of said compound.

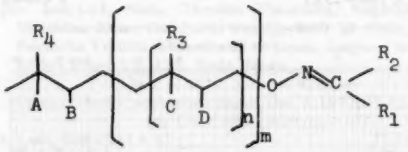
3,941,777

COMPOUNDS HAVING JUVENILE HORMONE ACTIVITY

Hans Berg Madsen, Bovlingbjerg; Preben Lindholm Holst, and Houk Solli, both of Harboor, all of Denmark, assignors to A/S Cheminova, Lemvig, Denmark

Filed Dec. 19, 1973, Ser. No. 426,385
Int. Cl.² C07D *303/18*; C07C *119/08*
U.S. Cl. 260—240 H **6 Claims**

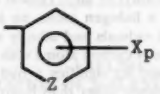
1. A compound of the formula:



(I)

in which the symbols have the following meanings:
AB: are taken together and represent an oxygen atom;
C: a hydrogen atom, and
D: a hydrogen atom, or

CD: when taken together a further single bond between the adjacent carbon atoms,
n: an integer which is 0 or 1,
m: an integer which is 0 or 1,
R_4: a methyl or ethyl group,
R_5: a methyl or ethyl group,
R_1: a hydrogen atom, or an alkyl group having from 1 to 6 carbon atoms,
R_2: a 3,4-methylenedioxyphenyl group, or a group having the general formula II



(II)

wherein Z is CH or a nitrogen atom, *p* is an integer from 0 to 3, and X is a hydrogen atom or at least one substituent selected from the group consisting of NO_2, halogen, OH, CF_3, alkyl and alkoxy, which, when *p* is 2 or 3, may be the same or different.

3,941,778

BIS(TRIAZINYLAMINO) STILBENE COMPOUNDS

Curt Mueller, Binningen, and Hans-Rudolf Schmid, Riehen, both of Switzerland, assignors to Sandoz Ltd., (Sandoz AG), Basel, Switzerland

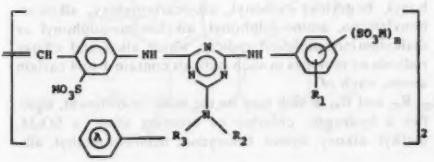
Filed Feb. 15, 1974, Ser. No. 442,920

Claims priority, application Switzerland, Feb. 21, 1973, 2521/73

Int. Cl.² C07D *403/12*

U.S. Cl. 260—240 B **14 Claims**

1. A compound of formula I,



I

wherein
R_1 is hydrogen, fluoro, chloro, bromo or C_{1-4} alkyl;
R_2 is hydrogen, cyclopentyl, cyclopentyl substituted by one to three C_{1-4} alkyl groups, cyclohexyl, cyclohexyl substituted by one to three C_{1-4} alkyl groups, C_{1-4} alkyl, C_{2-4} alkyl monosubstituted by hydroxy, C_{1-4} alkoxy or C_{2-4} hydroxyalkoxy, or C_{1-4} alkyl substituted by a radical of formula (a),

(a),

R_3 is C_{1-4} alkylene;
M is hydrogen or an equivalent of a colourless cation;
n is 1 or 2;
and the rings A and B are unsubstituted or substituted by 1 to 3 C_{1-4} alkyl groups, 1 or 2 substituents selected from C_{1-4} alkoxy, fluoro, chloro and bromo or one substituent selected from cyano and $—SO_3M$;
the compound containing at least six $—SO_3M$ groups per molecule.

3,941,779

METHOD FOR PRODUCING 2-(SUBSTITUTED THIO)-3-EPHEM DERIVATIVES

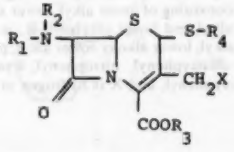
William A. Slusarchyk, Belle Mead; Joseph Edward Dolfini, Princeton, and Marian G. Young, Kendall Park, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Nov. 12, 1973, Ser. No. 415,198

Int. Cl.² C07D *501/04, 501/22*

U.S. Cl. 260—243 C **20 Claims**

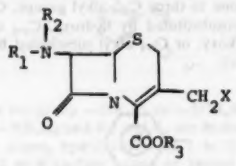
1. A process for the production of a compound of the formula



wherein R_1 and R_2 each is lower alkanoyl, benzoyl, halo-lower alkanoyl, lower alkyl-lower alkanoyl, lower alkoxy-lower alkanoyl, halobenzoyl, lower alkylbenzoyl or lower alkoxybenzoyl, or R_1 and R_2 taken together with the nitrogen form an alkyl dicarboxylic acid imide of the group consisting of maleimide, succinimide, phthalimide and naphthalene-1,2-dicarboxylic acid imide; R_3 is hydrogen or a protecting ester group of the group consisting of lower alkyl, lower alkoxybenzyl, halo-lower alkyl and lower alkylsilyl; R_4 is lower alkyl, halo-lower alkyl, lower alkoxy-lower alkyl, phenyl, halophenyl, lower alkoxyphe-

nyl, nitrophenyl, cyanophenyl or carboalkoxyphenyl; and X is hydrogen or acetoxy,

which comprises reacting a compound of the formula

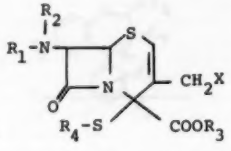


wherein R_1, R_2 and X have the meaning already defined and R_3 is a protecting ester group as defined above,

with a thiolating agent R_4SY or $(R_4S)_2$

wherein R_4 has the meaning defined above and Y is halogen, lower alkoxycarbonylthio, lower alkylthio or $-SO_2-Z$ wherein Z is lower alkyl or phenyl,

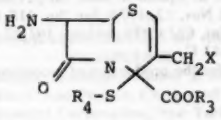
at a temperature in the range of about −78° to +30°C. in the presence of a strong base of the group consisting of alkali metal lower alkoxide, triphenylmethyl lithium, lithium lower alkylamide and lower metal hydride, to yield a product of the formula



wherein R_1, R_2, R_3, R_4 and X have the meaning defined above,

and effecting the rearrangement of said product with a hydrohalic acid, trifluoroacetic acid, benzenesulfonic acid, toluenesulfonic acid, or mercury, silver or copper salt.

12. A compound of the formula



wherein R_3 is hydrogen or a protecting ester group of the group consisting of lower alkyl, lower alkoxybenzyl, halo-lower alkyl and lower alkylsilyl; R_4 is lower alkyl, halo-lower alkyl, lower alkoxy-lower alkyl, phenyl, halophenyl, lower alkoxyphenyl, nitrophenyl, cyanophenyl or carboalkoxyphenyl; and X is hydrogen or acetoxy.

3,941,780

COUMARIN COMPOUNDS

Werner Koch, Oberwil, Switzerland, assignor to Sandoz Ltd., (Sandoz AG), Basel, Switzerland

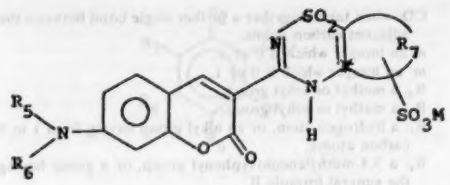
Filed Aug. 27, 1973, Ser. No. 391,568

Claims priority, application Switzerland, Aug. 29, 1972, 12721/72

Int. Cl.² C07D *285/24*

U.S. Cl. 260—243 D **19 Claims**

1. A compound, of formula *Ia*,

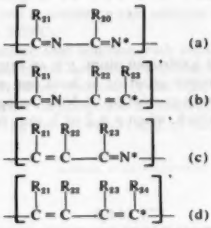


Ia

in which each of

R_5 and R_6, which may be the same or different, signifies a hydrogen atom, an alkyl or allyl, radical or an alkyl radical substituted by a halogen atom, an alkoxy or cyano group, which alkyl radicals and alkoxy moieties in such radicals contain 1 to 4 carbon atoms with the proviso that when one of R_5 and R_6 signifies a hydrogen atom the other has a significance other than hydrogen,

R_7 signifies a radical of formula (*a*), (*b*), (*c*), (*d*), or (*e*)



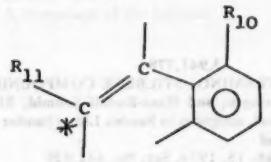
(a)

(b)

(c)

(d)

or



(e)

in which

R_{20} signifies SO_3M,

R_{21} signifies a hydrogen chlorine or bromine atom, a alkyl, alkoxy, cyano, thiocyano, trifluoromethyl, alkoxycarbonyl, benzyloxy-carbonyl, alkylcarbonyloxy, alkylcarbonylamino, amino-sulphonyl, alkylamino-sulphonyl or dialkylamino-sulphonyl radical, which alkyl and alkoxy radicals or moieties in such radicals contain 1 to 4 carbon atoms, each of

R_{22}, R_{23} and R_{24}, which may be the same or different, signifies a hydrogen, chlorine or bromine atom, a SO_3M, methyl, alkoxy, cyano, thiocyano, trifluoro-methyl, alk-

oxycarbonyl, benzyloxycarbonyl, alkyl-carbonyloxy, alkylcarbonyl-amino, aminosulphonyl or alkylaminosulphonyl radical, which alkyl and alkoxy radicals or moieties in such radicals contain 1 to 4 carbon atoms, with the proviso that each of radicals of formula (*a*) (*b*) (*c*) and (*d*) bear only one $-SO_3M$ group and the radical of formula (*d*) bears not more than two substituents in addition to the $-SO_3M$ group,

R_{10} signifies hydrogen, amino-sulphonyl or $-SO_3M$,

R_{11} signifies a hydrogen atom or $-SO_3M$ with the proviso that the radical of formula (*e*) contains only one $-SO_3M$ group,

the atom of radical (*a*) to (*e*) marked *, being, in each case, bound to the carbon atom designated by the same mark in formula I*a*, and

M is hydrogen or an alkali metal.

3,941,781

PREPARATION OF 3-ALKYLTHIOMETHYL CEPHALOSPORINS

Ian G. Wright, Greenwood, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 211,692, Dec. 23, 1971, abandoned. This application Oct. 23, 1973, Ser. No. 408,352

Int. Cl.² C07D *501/04*

U.S. Cl. 260—243 C **14 Claims**

1. In a process for the preparation of 3-alkylthiomethyl-7-acylamido cephalosporins in which a 3-alkanoyloxymethyl-7-acylamido cephalosporin is reacted with an alkane thiol containing 1-6 carbon atoms, the improvement comprising carrying out the reaction in aqueous medium in the presence of an effective amount of an inorganic salt selected from the group consisting of the highly water soluble iodide, bromide, thiocyanate, nitrate and sulfate salts of the metals of Groups I and II and ammonium iodide to increase the yield of the 3-alkylthiomethyl-7-acylamido cephalosporin.

3,941,782

HETEROCYCLIC ESTERS OF BENZOPYRANS

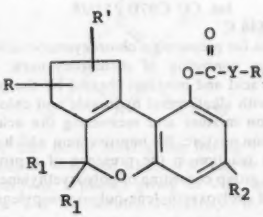
Louis Selig Harris, Chapel Hill, N.C.; Harry George Pars, Lexington, Mass.; Raj Kumar Razdan, Belmont, Mass., and John Clark Sheehan, Lexington, Mass., assignors to Sharps Associates, Cambridge, Mass.

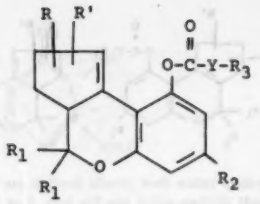
Continuation-in-part of Ser. No. 248,308, April 27, 1972, abandoned, which is a continuation-in-part of Ser. No. 143,688, May 12, 1971, abandoned. This application May 21, 1973, Ser. No. 361,897

Int. Cl.² C07D *311/78*

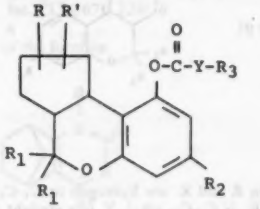
U.S. Cl. 260—243 B **20 Claims**

1. A compound represented by the formulae:



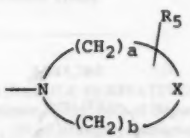


or



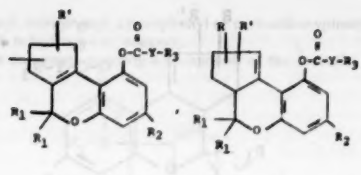
wherein R and R′ are hydrogen or C_1–C_6 alkyl; R_1 is C_1–C_6 alkyl; R_2 is C_1–C_{20} alkyl; Y is a straight or branched chain C_1–C_8 alkylene; and R_3 is

, and

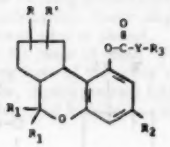


wherein *a* is 2, *b* is 2, X is O, S or NR_4 wherein R_4 is hydrogen or a C_1–C_6 alkyl and R_5 is hydrogen or a C_1–C_6 alkyl, or a pharmaceutically acceptable acid addition salt thereof.

11. A compound represented by the formulae:



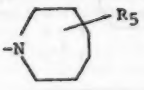
or



wherein R and R' are hydrogen or C_1–C_6 alkyl; R_1 is C_1–C_6 alkyl; R_2 is C_1–C_{20} alkyl, Y is a straight or branched chain C_1–C_8 alkylene; and R_3 is

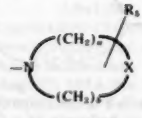
,

,



,

and



wherein *a* is 2, *b* is 2, X is O, S or NR_4 wherein R_4 is hydrogen or a C_1–C_6 alkyl and R_5 is hydrogen or a C_1–C_6 alkyl, or a pharmaceutically acceptable acid addition salt thereof.

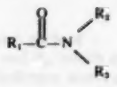
3,941,783

PROCESS FOR THE PRODUCTION OF N,N-DISUBSTITUTED CARBOXYLIC AMIDES

Erzsébet Grega; Pál Gribovszky; Sándor Marósvolgyi; Zoltán Pintér; Gyula Szilágyi; István Szita, all of Miskolc; Csaba Tarr, Sajobabony, and László Tasi, Miskolc, all of Hungary, assignors to Eszakmagyarorszagi Vegyimuvek, Sajobabony, Hungary

Filed Dec. 4, 1973, Ser. No. 421,642
Int. Cl.² C07D 295/00
U.S. Cl. 260—247.7 V **2 Claims**

1. Process for the production of N,N-disubstituted carboxylic amides of the formula

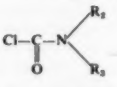


wherein

R_1 is C_2 – C_{18} straight or branched alkyl, a halogen-substituted alkyl, a phenyl-substituted alkyl, phenyl, chloro-dichloro-substituted phenyl, nitro- dinitro-substituted phenyl, trimethoxyphenyl, six-membered unsaturated heterocyclic having a nitrogen atom;

R_2 and R_3 are identical or different, C_1—C_4 straight or branched alkyl, phenyl or R_2 and R_3 form together a six-membered heterocycle with a nitrogen atom and an oxygen atom, characterized by reacting a carboxylic acid of the formula

wherein R_1 has the same meaning as above, with a carbamoyl chloride of the formula



wherein R_2 and R_3 have the same meaning as above, at a temperature of 100° – 300°C., and separating the thus-formed N,N-disubstituted carboxylic amide from the reaction mixture.

3,941,784

PRODUCTION OF CHLOROCYANURIC ACID

George D. Nelson, Creve Coeur; Kenneth J. Nissing, St. Charles, and William F. Symes, Webster Groves, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 26, 1974, Ser. No. 536,499
Int. Cl.² C07D 251/28
U.S. Cl. 260—248 C **8 Claims**

1. In a process for preparing a chlorocyanuric acid selected from the group consisting of dichlorocyanuric acid, trichlorocyanuric acid and mixtures thereof by the reaction of cyanuric acid with alkali metal hydroxide and chlorine in an aqueous reaction mixture and recovering the acid product from said reaction mixture, the improvement which comprises conducting the reaction in the presence of a promoter selected from the group consisting of polyoxyethylene, polyoxypropylene, and polyoxyethylene-polyoxypropylene copolymers.

3,941,785

IMIDAZO [5,1-F]-AS-TRIAZINES

Robert William Clarke; David Hartley, and Alexander William Oxford, all of London, England, assignors to Allen & Hanburys Limited, London, England,

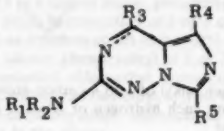
Filed Dec. 26, 1973, Ser. No. 427,558

Claims priority, application United Kingdom, Jan. 4, 1973, 553/73

Int. Cl.² C07D *253/08*

U.S. Cl. 260—249.5 64 Claims

1. A compound of the formula:



in which

R_1 and R_2 may be the same or different, represent a hydrogen atom, or a C_{1-6} alkyl group which may optionally be substituted by a phenyl group, or represent a C_{1-6} alkanoyl group of C_{1-6} alkane sulphonyl group;

R_3 represents a hydrogen atom, or a C_{1-6} alkyl group which may optionally be subtituted by a phenyl group, or represents a C_{2-6} alkenyl group, phenyl, methoxyphenyl, or C_{1-6} alkylthio group;

R_4 represents a hydrogen atom or C_{1-6} alkyl group; and

R_5 represents a hydrogen atom, a C_{1-6} alkyl group, which alkyl group may optionally be substituted by a C_{3-7} cycloalkyl group, or a phenyl group, and physiologically acceptable salts and addition products formed by nucleophilic addition.

3,941,786

PROCESS FOR THE PRODUCTION OF 4-HYDROXY-6-HYDROXYMETHYLPYRIMIDINE

Erich Greth, Visp, Switzerland, assignor to Lonza Ltd., Gampe, Valais, Switzerland

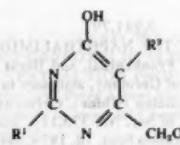
Continuation-in-part of Ser. No. 258,485, June 1, 1972, abandoned. This application June 12, 1974, Ser. No. 478,733

Claims priority, application Switzerland, June 7, 1971, 8251/71

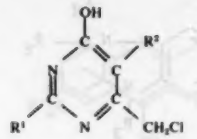
Int. Cl.² C07D *239/26*

U.S. Cl. 260—251 R 24 Claims

1. A process for the production of 2-R^1 substituted-4-hydroxy -5-R^2 substituted-6-hydroxymethyl-pyrimidines having the following formula:



wherein R^1 can be an alkyl group having 1 to 10 carbons, phenyl group or —H, and wherein R^2 can be an alkyl having 1 to 10 carbons, a phenyl group or —H, which comprises reacting a 2-R^1 substituted-4-hydroxy-5-R^2 substituted-6-chloromethyl-pyrimidine having the following formula:



wherein R^1 and R^2 are defined above, with water under reflux at a pH value of 4 to 8, said pH not being outside the stated range during said reaction.

3,941,787

1,4-DISUBSTITUTED-5,8-METHANO-TETRAHYDRO-QUINAZOLINONES

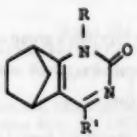
William G. Salmond, Kalamazoo, Mich., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed July 22, 1974, Ser. No. 491,170

Int. Cl.² C07D *239/70*

U.S. Cl. 260—251 A 10 Claims

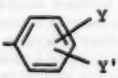
1. A compound of the formula



wherein:

R is lower alkyl of 1 to 6 carbon atoms, cycloalkyl of 3 to 8 carbon atoms or cycloalkylalkyl of 4 to 10 carbon atoms in which the cycloalkyl is of 3 to 8 carbon atoms and the alkyl of 1 to 3 carbon atoms,

R′ is a radical of the formula



in which Y and Y′ are the same or different and represent hydrogen, halo of atomic weight of 18 to 36, alkyl having from 1 to 2 carbon atoms, alkoxy having from 1 to 2 carbon atoms, or one of Y and Y′ is trifluoromethyl while the other is hydrogen, or a radical of the formula

in which Y″ is hydrogen, halo of atomic weight of from 18 to 36 or alkyl of 1 to 3 carbon atoms.

3,941,788

BENZIMIDAZOLE DERIVATIVES

Olga Hankovszky; Kalman Hideg, both of Hajnoczy, and Sandor Pacsa, Pollack, all of Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt, Budapest, Hungary

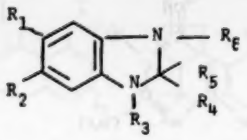
Filed Apr. 24, 1974, Ser. No. 463,686

Claims priority, application Hungary, May 9, 1973, RI-508

Int. Cl.² C07D *239/06*

U.S. Cl. 260—256.4 F 3 Claims

1. a compound of the formula (I)

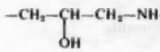


(I)

or a hydrochloride addition salt thereof, wherein

R_1 and R_2 each represent hydrogen or methyl,

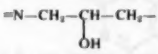
R_3 and R_6 form together a valence bond and at the same time R_3 and R_4 form together a group of the formula (II),



(II)

or

R_4 and R_5 and R_6 form together a group of the formula (III)



(III)

and at the same time R_3 stands for benzyl group.

3,941,789
N-ARYL-N'-(PHENYL-OR PHENOXY-ALKYL)-PIPERAZINES AND SALTS THEREOF

Ernst-Otto Renth; Anton Mentrup; Kurt Schromm, all of Ingelheim am Rhein, and Peter Danneberg, Ockenheim, all of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

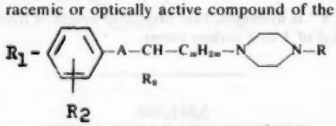
Filed Dec. 21, 1973, Ser. No. 427,367

Claims priority, application Germany, Dec. 23, 1972, 2263211

Int. Cl.² C07D *241/02*

U.S. Cl. 260—268 BC **7 Claims**

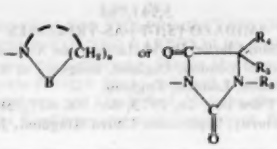
1. A racemic or optically active compound of the formula



wherein

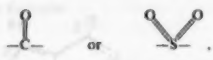
R is phenyl; phenyl having one or two substituents attached thereto, said substituents being selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylthio of 1 to 4 carbon atoms, chlorine and trifluoromethyl; naphthyl; tetrahydronaphthyl; indanyl; pyridyl; thiazolyl; or isoquinolyl;

R_1 is



where

B is



n is 2 or 3

R_3 is hydrogen, alkyl of 1 to 4 carbon atoms,

R_4 and R_5 are each hydrogen or alkyl of 1 to 4 carbon atoms, and

Q is oxygen or two hydrogens,

R_2 is hydrogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or halogen,

A is a single carbon-to-carbon bond or $-OCH_2-$,

R_6 is hydrogen, hydroxyl, alkoxy of 1 to 4 carbon atoms or alkanoyloxy of 1 to 4 carbon atoms, and

m is 0, 1, 2, 3, 4 or 5, but other than 0 when R_6 is hydroxyl,

or a non-toxic, pharmacologically acceptable acid addition salt thereof.

3,941,790
BIS DIKETOPIPERAZINES

Andrew Malcolm Creighton, London, England, assignor to National Research Development Corporation, England

Division of Ser. No. 310,700, Nov. 30, 1972, abandoned, which is a continuation-in-part of Ser. No. 126,276, March 19, 1971, abandoned, which is a continuation-in-part of Ser. No. 741,874, July 2, 1968, abandoned. This application Feb. 21, 1974, Ser. No. 444,485

Claims priority, application United Kingdom, July 3, 1967, 30617/67

Int. Cl.² C07D *295/10*

U.S. Cl. 260—268 DK **7 Claims**

1. A bis(3,5-dioxopiperazin-1-yl) alkane selected from the group consisting of:

1,2-bis(3,5-dioxopiperazin-1-yl) propane,

meso-2,3-bis(3,5-dioxopiperazin-1-yl) butane,

1,2-bis(3,5-dioxopiperazin-1-yl) cyclobutane,

and acid addition salts thereof with a physiologically acceptable inorganic or organic acid.

3,941,791
COMPOUNDS OF THE NAPHTHALIMIDE SERIES

Renate Elisabeth Heil, Frankenthal, and Horst Scheuermann, Ludwigshafen, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

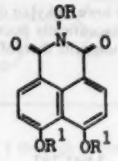
Continuation-in-part of Ser. No. 373,114, June 25, 1973, abandoned. This application Sept. 18, 1974, Ser. No. 507,190

Claims priority, application Germany, June 28, 1972, 2231609

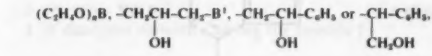
Int. Cl.² C07D *217/24*

U.S. Cl. 260—281 Q **8 Claims**

1. A compound of the formula



in which R is alkyl of 1 to 18 carbon atoms, allyl, cycloalkyl, cycloalkyl of 5 to 8 carbon atoms, phenylalkyl of 1 to 4 carbon atoms in the alkyl, hydroxyalkyl of 2 or 3 carbon atoms, alkoxyalkyl of 2 or 3 carbon atoms in the alkyl and 1 to 8 carbon atoms in the alkoxy, phenoxyalkyl of 2 or 3 carbon atoms in the alkyl, cyanoethyl, chloroethyl, bromoethyl, chloropropyl, bromopropyl, alkoxycarbonylethyl of 1 to 8 carbon atoms in the alkoxy, β-carbamoylethyl, alkoxycarbonylmethyl of 1 to 8 carbon atoms in the alkoxy,



n is 2, 3 or 4; B is hydrogen or alkyl of 1 to 4 carbon atoms; B^1 is hydroxy, alkoxy of 1 to 8 carbon atoms, β-alkoxyethoxy of 1 to 4 carbon atoms in the alkoxy, phenoxy, phenoxy substituted by chloro, methyl or methoxy, phenylmercapto or methoxyphenylmercapto; and R^1 is alkyl of 1 to 6 carbon atoms, hydroxyalkyl of 2 to 6 carbon atoms, alkoxyalkyl of 1 to 4 carbon atoms in the alkoxy and 2 to 6 carbon atoms in the alkyl or $(CH_2CH_2O)_nB$.

3,941,792

CHARGE TRANSFER COMPLEXES CONTAINING 7,7,8,8-TETRACYANOQUINODIMETHANE AND AN N-SUBSTITUTED QUATERNARY QUINOLINE

Mutsuaki Murakami, Kawasaki, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed June 7, 1973, Ser. No. 367,720

Claims priority, application Japan, June 8, 1972, 47-57503

Int. Cl.² C07D *215/10*

U.S. Cl. 260—286 Q **2 Claims**

1. A charge transfer complex of 7,7,8,8-tetracyanoquinodimethane (TCNQ) and an N-alkylated quinoline, the alkyl group having 1 to 18 carbon atoms, the complex comprising both ionized TCNQ molecules and non-ionized molecules, the mole number of the non-ionized TCNQ molecules per mole of the complex being other than one.

3,941,793

QUINOLINE 2 CARBOXYLIC ACIDS USED IN METAL EXTRACTION PROCESSES

Norman Ackerley, and Peter Albert Mack, both of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

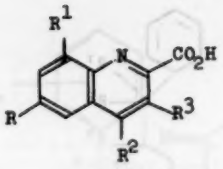
Filed July 24, 1973, Ser. No. 382,197

Claims priority, application United Kingdom, Aug. 4, 1972, 36560/72

Int. Cl.² C07D *215/16*

U.S. Cl. 260—287 G **4 Claims**

1. A quinoline-2-carboxylic acid of the formula



wherein R is a methoxy group or an alkyl group containing up to 12 carbon atoms, R^1 is a hydrogen atom or a methyl group, R^2 is a branched chain alkoxy group containing up to 12 carbon atoms, a phenoxy group substituted by one or two alkyl groups containing a total of not more than 12 carbon atoms or a benzyloxy group substituted by one or two alkyl groups containing a total of not more than 12 carbon atoms, and R^3 is a hydrogen atom or a n-propyl group.

3,941,794

COATING OF PAPER WITH RESIN-TREATED SILICATES

Peter James Malden, Byways, Bodmin Hill, Lostwithiel, Cornwall, England

Continuation of Ser. No. 183,664, Sept. 24, 1971, abandoned.

This application Mar. 12, 1974, Ser. No. 450,386

Claims priority, application United Kingdom, Sept. 25, 1970, 45911/70

Int. Cl.² C08K *3/34*

U.S. Cl. 260—29.2 EP **9 Claims**

1. A method of improving the optical properties of mineral coated paper in which the mineral is a silicate mineral having a layer lattice structure, which comprises treating the mineral prior to its incorporation into a paper coating composition so as to cement together the ultra fine particles of the mineral and to form an inelastic material therefrom, the treatment comprising (i) forming a substantially uniform suspension of fine particles of the mineral in water; (ii) admixing the suspension thus obtained with a polymer which is a non-amylaceous latex and which is (a) initially water-soluble or water-dispersible and (b) such that, on drying the suspension, the particles of the mineral adhere to the polymer and to one another and the polymer is irreversibly rendered insoluble and non-dispersible in water, the amount of said polymer being from 0.1 to 2.0% by weight based on the weight of dry mineral; (iii) flocculating the aqueous suspension; (iv) dewatering and drying the suspension including the step of heating to a temperature not more than 80°C. so as to bind the polymer to the mineral particles and to render said polymer irreversibly insoluble and non-dispersible in water; and (v) thereafter dispersing the treated mineral in an aqueous medium containing an adhesive to produce a paper coating composition; and (vi) coating paper with said composition.

3,941,795

α-ARYL-4-SUBSTITUTED PIPERIDINOALKANOL DERIVATIVES

Albert A. Carr, and C. Richard Kinsolving, both of Cincinnati, Ohio, assignors to Richardson-Merrell Inc., Wilton, Conn.

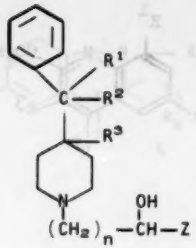
Filed Feb. 8, 1974, Ser. No. 440,855

The portion of the term of this patent subsequent to Apr. 15, 1992, has been disclaimed.

Int. Cl.² C07D *211/22*

U.S. Cl. 260—293.83 **7 Claims**

1. A compound selected from a base of the formula



wherein R^1 is selected from the group consisting of cyclohexyl, phenyl or a substituted phenyl ring wherein the substituent on the substituted phenyl ring is attached at the ortho, meta, or para position of the phenyl ring and is selected from the group consisting of halogen, a straight or branched lower alkyl group of from 1 to 4 carbon atoms, or a lower alkoxy group of from 1 to 4 carbon atoms; R^2 is selected from hydrogen or hydroxy; R^3 is hydrogen; or R^2 and R^3 taken together form a second bond between the carbon atoms bearing R^2 and R^3; n is an integer of from 1 to 3; Z is selected from the group consisting of thienyl, naphthyl, phenyl or a substituted phenyl ring wherein the substituent on the substituted phenyl ring is attached at the ortho, meta, or para position of the phenyl ring and is selected from the group consisting of halogen, a straight or branched alkyl group of from 1 to 6 carbon atoms, an alkoxy group of from 1 to 6 carbon atoms, a cycloalkyl group of from 3 to 6 carbon atoms, di(lower)alkylamino, or a saturated monocyclic heterocyclic group such as pyrrolidino, piperidino, morpholino or N-(lower)alkylpiperazino with the proviso that when R^1 is phenyl, Z is naphthyl or a substituted phenyl ring wherein the substituent on the substituted phenyl ring is attached at the ortho, meta of para position of the phenyl ring and is selected from the group consisting of a straight or branched alkyl group of 5 or 6 carbon atoms, an alkoxy group of 5 to 6 carbon atoms, of cycloalkyl of 3 to 6 carbon atoms; and pharmaceutically acceptable acid addition salts thereof.

3,941,796

α-(HYDROXY AND ALKOXY SUBSTITUTED)PHENYL-α-(2-PIPERIDINYL)-METHANOLS

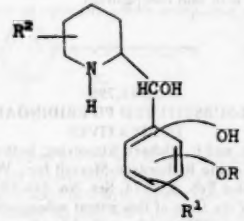
George H. Sankey, Loughborough, and Keith D. E. Whiting, Hatfield, both of England, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 39,571, May 21, 1970, abandoned. This application July 11, 1974, Ser. No. 487,661

Int. Cl.² C07D *211/22*

U.S. Cl. 260—293.84 **7 Claims**

1. A compound of the formula



wherein R is hydrogen or lower alkyl, R^1 is hydrogen, hydroxy or lower alkoxy and R^2 is phenyl, phenyl-lower alkyl, diphenyl-lower alkyl, phenoxy-lower alkyl or diphenoxy-lower alkyl and the nontoxic pharmaceutically acceptable acid addition and quaternary ammonium salts thereof.

3,941,797

4-(HYDROXY-SUBSTITUTED-AMINO)-FURO[3,2-C]PYRIDINES

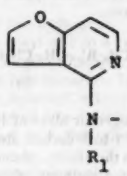
William R. Simpson, Mendham, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Division of Ser. No. 296,442, Oct. 10, 1972, Pat. No. 3,853,877. This application July 26, 1974, Ser. No. 492,063

Int. Cl.² C07D *405/04*

U.S. Cl. 260—296 H **12 Claims**

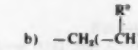
1. A compound of the formula:



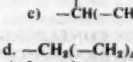
wherein

R is from the group of:

a. $-CH_2(-CH_2)_x-ONO_2$



b) $-CH_2(-CH)_x-ONO_2$



c) $-CH(-CH_2)_x-ONO_2$

d. $-CH_2(-CH_2)_z-N[-CH_2(-CH_2)_y-ONO_2]_2$

R_1 is from the group of:

e. $-CH_2(-CH_2)_x-ONO_2$ when R is a) as above defined,

f. hydrogen or alkyl of 1 to 4 carbon atoms,

R′ is $-(CH_2-)_xCH_3$ or $-(CH_2-)_xONO_2$,

R^o is hydrogen, $-(CH_2-)_mCH_3$ or $-(CH_2-)_yONO_2$, provided that one R^o is other than hydrogen, that the sum of *n* and *m* does not exceed 7 and the sum of *n* and *y* does not exceed 8,

n is 1 to 7,

m is 0 to 4,

x is 0 to 1,

y is 1 to 4, and

z is 1 to 4, or

a pharmaceutically acceptable acid addition salt thereof.

3,941,798

5-ALKYL-3-(2-HYDROXYLAMINO-4-CHLOROPHENYL)-1,3,4-OXADIAZOLIN-2-ONE COMPOUNDS

Jean-Francois Fort, Paris, and Raymond Giraudon, Le Parc de Lesigny, both of France, assignors to Rhone Poulenc S.A., Paris, France

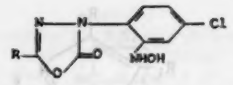
Division of Ser. No. 453,055, March 20, 1974. This application Apr. 10, 1975, Ser. No. 566,971

Claims priority, application France, Mar. 22, 1973, 73.10291

Int. Cl.² C07D *271/10*

U.S. Cl. 260—307 A **1 Claim**

1. A hydroxylamine compound of the formula:



wherein R is alkyl of 1 through 4 carbon atoms.

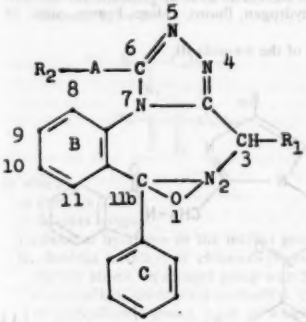
3,941,799

6-SUBSTITUTED-11B-PHENYL-3, 11BH-OXAZIRINO[2,3-D]-S-TRIAZOL[4,3-A[]1,4]BENZODIAZEPINES

Hans Allgeier, Haagen, BD., Germany, and Andre Gagneux, Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 16, 1973, Ser. No. 360,852
Claims priority, application Switzerland, May 18, 1972, 7386/72
Int. Cl.² C07D *498/14*
U.S. Cl. 260—308 R 6 Claims

1. A diazepine derivative having the formula I



(I)

wherein

R_1 represents hydrogen or an alkyl group having 1 to 3 carbon atoms,

A represents an alkylene group having 1 to 3 carbon atoms,

R_2 represents a hydroxyl group, benzyloxy, o-, m- or p-chlorobenzyloxy o-, m- or p-methylbenzyloxy, o-, m- or p-methoxybenzyloxy, or diphenylmethoxy group, or

R_2—A together represent a dialkoxymethyl group of which the alkoxy radicals contain 1 to 4 carbon atoms, and

each of the rings B and C, independently of the other, is unsubstituted or mono-substituted by halogen up to atomic number 35, trifluoromethyl, alkyl or alkoxy groups having 1 to 6 carbon atoms.

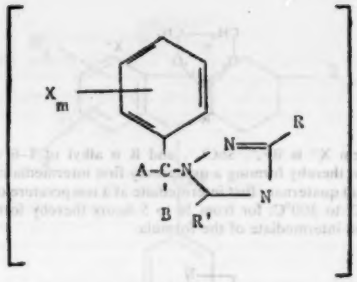
3,941,800

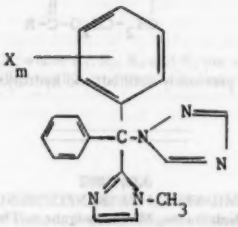
N-BENZYLTRIAZOLE COMPOUNDS

Wilfried Draber, Wuppertal-Elberfeld; Erik Regel, Wuppertal-Cronenberg; Karl-Heinz Buchel, Wuppertal-Elberfeld; Ludwig Eue, Cologne, and Robert R. Schmidt, Leverkusen-Rheindorf, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 96,574, Dec. 9, 1970, Pat. No. 3,801,590.
This application Oct. 12, 1973, Ser. No. 405,969
Claims priority, application Germany, Dec. 24, 1969, 1964995
Int. Cl.² C07D *249/08*
U.S. Cl. 260—308 R 5 Claims

1. N-benzyltriazole compound of the formula





wherein

X is chlorine, alkyl with 1 to 4 carbon atoms or phenyl,

m is 0 or 1;

and salts thereof with plant-tolerated acids.

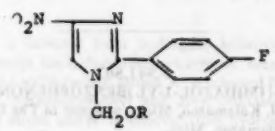
3,941,801

PROCESS FOR PREPARING SUBSTITUTED NITROIMIDAZOLES

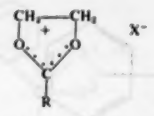
Ludwig Saice, Brewster, N.Y., and Erwin F. Schoenewaldt, Watchung, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 286,638, Sept. 6, 1972, abandoned, Continuation-in-part of Ser. No. 40,449, May 25, 1970, abandoned. This application Dec. 5, 1974, Ser. No. 529,864
Int. Cl.² C07D *233/94*
U.S. Cl. 260—309 3 Claims

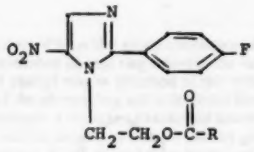
2. A process for preparing 1-(2'-hydroxyethyl)-2-(p-fluorophenyl)-5-nitroimidazole by reacting in a solvent selected from the group consisting of 1,2-dimethoxyethane, 1,2-dichloroethane, dioxane, methylene chloride, ethyl acetate, methyl formate of 1,2-diacetoxyethane at a temperature of −10°C. to the reflux temperature of said solvent for from 15 minutes to 24 hours, each molar equivalent of a compound of the formula:



with from 1 to 5 molar equivalents of a compound of the formula:



wherein X^- is BF_4^-, $SbCl_6^-$, and R is alkyl of 1–6 carbon atoms, thereby forming a quaternary first intermediate; heating said quaternary first intermediate at a temperature of from 100°C. to 300°C. for from ½ to 5 hours thereby forming a second intermediate of the formula:



where R is as previously defined; and hydrolyzing the second intermediate.

3,941,802

2-(IMIDAZOL-1-YL)BENZOPHENONES

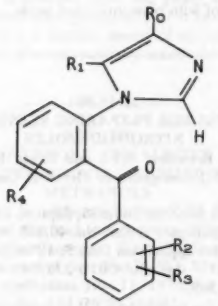
Martin Gall, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Apr. 4, 1975, Ser. No. 565,107

Int. Cl.² C07D *233/60*

U.S. Cl. 260—309 **12 Claims**

1. A compound of the formula V:



V

wherein R_6 and R_1 are hydrogen or alkyl of 1 to 3 carbon atoms, inclusive; wherein R_2 is hydrogen, fluoro, chloro, or trifluoromethyl; wherein R_3 is hydrogen or fluoro with the proviso that R_3 is not fluoro, if R_2 is chloro or trifluoromethyl; and wherein R_4 is hydrogen, fluoro, chloro, bromo, trifluoromethyl, or nitro.

3,941,803

2-(IMIDAZOL-1-YL)BENZOPHENONES

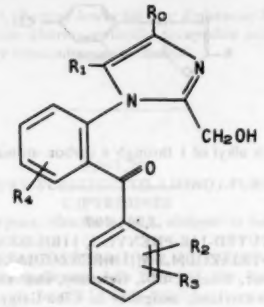
Martin Gall, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Mar. 28, 1975, Ser. No. 563,079

Int. Cl.² C07D *233/60, 209/48*

U.S. Cl. 260—309 **22 Claims**

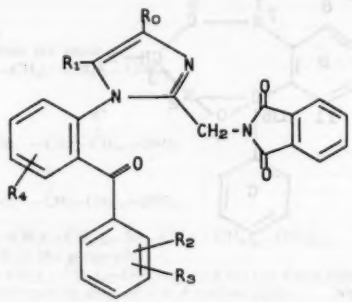
1. A compound of the formula II:



II

wherein R_6 and R_1 are hydrogen or alkyl of 1 to 3 carbon atoms, inclusive; wherein R_2 is hydrogen, chloro, fluoro, or trifluoromethyl; wherein R_3 is hydrogen, or fluoro with the proviso that R_3 is not fluoro, if R_2 is chloro or trifluoromethyl; and wherein R_4 is hydrogen, fluoro, chloro, bromo, nitro, or trifluoromethyl,

12. A compound of the formula III:



III

wherein R_6 and R_1 are hydrogen or alkyl of 1 to 3 carbon atoms, inclusive; wherein R_2 is hydrogen, chloro, fluoro, or trifluoromethyl; wherein R_3 is hydrogen or fluoro with the proviso that R_3 is not fluoro, if R_2 is chloro or trifluoromethyl; and wherein R_4 is hydrogen, chloro, fluoro, bromo, nitro, or trifluoromethyl.

3,941,804

1-HETEROARYLSULPHONYL-2-IMINO-IMIDAZOLIDINES

Atso Ilvespää, Allschwil; André Gagneux; Ernst Schweizer, both of Basel, and Jörg Frei, Schonenbuch, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

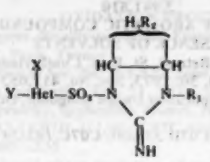
Filed July 15, 1974, Ser. No. 488,879

Claims priority, application Switzerland, July 27, 1973, 10998/73; Apr. 10, 1974, 5067/74

Int. Cl.² C07D *49/34*

U.S. Cl. 260—309.7 **5 Claims**

1. An imidazolidine compound of the formula I



(I)

in which

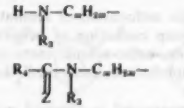
Het is a thienyl radical,

R_1 denotes an alkyl group with at most 12 carbon atoms, an alkenyl group with 3 to 5 carbon atoms, a cycloalkyl, lower alkyl-cycloalkyl, cycloalkenyl or lower alkyl-cycloalkenyl group, each of which of at most 7 carbon atoms, or 7 to 9 carbon atoms,

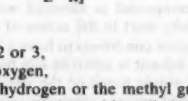
R_2 denotes hydrogen, or the methyl or ethyl group,

X denotes hydrogen, halogen up to atomic number 35, an alkyl group which is or is not interrupted by 1 or by 2 non-adjacent oxygen or sulphur atoms and contains a total of at most 7 carbon atoms, or the hydroxyl group, the amino group or an alkanamido group with at most 4 carbon atoms, and

Y has the meaning of X or denotes a radical of the partial formula Ia or Ib



(Ia)



(Ib)

in which

m denotes 2 or 3,

Z denotes oxygen,

R_3 denotes hydrogen or the methyl group,

R_4 denotes an alkyl or chloroalkyl group with at most 7 carbon atoms, an alkenyl group with 2 to 5 carbon atoms, a cycloalkyl, lower alkyl-cycloalkyl, cycloalkenyl or lower-cycloalkenyl group, each of which with a total of at most 8 carbon atoms, a phenyl group, a phenylalkyl group of 7 to 10 carbon atoms or a phenylalkenyl group of 8 to 10 carbon atoms, whereby the phenyl group present as R_4 or as a part of R_4 is unsubstituted or substituted by one to three substituents selected from the group consisting of halogen up to atomic number 35, trifluoromethyl, alkyl with at most 4 carbon atoms, hydroxy, alkoxy with at most 2 carbon atoms and alkylthio with at most 2 carbon atoms,

and the pharmaceutically acceptable addition salt of the compound of formula I with inorganic or organic acids.

3,941,805

3-HALOMETHYLCARBONYL-9-BENZOYL-1,2,3,4-TETRAHYDROCARBAZOLES

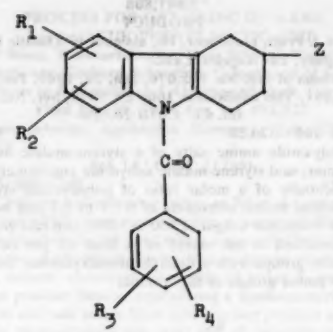
Ernest John Alexander, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 307,477, Nov. 17, 1972, Pat. No. 3,835,152. This application Feb. 20, 1974, Ser. No. 444,165

Int. Cl.² C07D *209/86*

U.S. Cl. 260—315 **5 Claims**

1. A 3-Z-9-(R_3-R_4-benzoyl)-R_1-R_2-1,2,3,4-tetrahydrocarbazole having the formula:



wherein

Z is $COCH_2X$, where R_1, R_2, R_3 and R_4 are each hydrogen or lower-alkyl, and X is chloro or bromo.

3,941,806

7-(α-ACETYLBENZYL)INDOLINE

William John Welstead, Jr., and Ying-Ho Chen, both of Richmond, Va., assignors to A. H. Robins Company, Richmond, Va.

Continuation-in-part of Ser. No. 28,561, April 14, 1970, abandoned. This application Jan. 18, 1972, Ser. No. 218,833

Int. Cl.² C07D *209/12;* **A61K** *31/40*

U.S. Cl. 260—326.11 R **1 Claim**

1. 7-(α-Acetylbenzyl)indoline.

3,941,807

INDOLE DEHYDRO PHTHALIDES AND NAPHTHALIDES

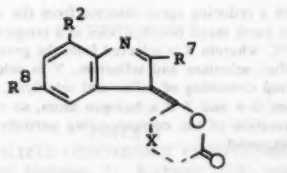
Alan L. Borror, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 108,662, Jan. 21, 1971, abandoned. This application Feb. 28, 1974, Ser. No. 446,732

Int. Cl.² C07D *209/18*

U.S. Cl. 260—326.13 R **7 Claims**

1. A compound of the formula:



wherein R^2 is selected from hydrogen, hydroxy, carboxy, o-hydroxyphenyl, bis-trifluoromethylcarbinol, methoxy, alkyl containing one to 16 carbon atoms; R^7 is selected from hydrogen, phenyl, o-hydroxyphenyl and alkyl containing one to three carbon atoms and R^8 is selected from hydrogen, cyano, carboxy, halo, trifluoromethyl, and alkoxy containing one to 18 carbon atoms and X represents the carbon atoms necessary to complete a ring-closing moiety selected from phthalide, unsubstituted or substituted in one of the 4- or 7-positions with carboxy, and naphthalide, unsubstituted.

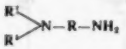
3,941,808

PRODUCT

Richard J. Pratt, Flossmoor, Ill., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Division of Ser. No. 795,070, Jan. 29, 1969, Pat. No. 3,575,861. This application June 29, 1970, Ser. No. 60,171
Int. Cl.² C07D 207/20
U.S. Cl. 260—326.26 9 Claims

1. Polyamide amine salts of a styrene-maleic anhydride copolymer; said styrene-maleic anhydride copolymer consisting essentially of a molar ratio of polymerized styrene to polymerized maleic anhydride of 0.1:1 to 5:1 and having an average molecular weight of 400 to 5,000, and said copolymer being imidized to the extent of at least 65 per cent of its anhydride groups with a dialkylaminoalkylamine containing tertiary amine groups of the formula



wherein R is alkylene of 2 to 30 carbon atoms and R' is alkyl of 1 to 5 carbon atoms, and wherein the tertiary amine groups of said dialkylaminoalkylamine are at least 75 per cent neutralized with a monocarboxylic acid having an aliphatic carbon to carbon chain of 8 to 36 carbon atoms.

3,941,809

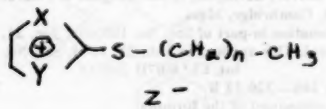
TECHNIQUE FOR PREPARATION OF FULVALENES

Martin Louis Kaplan, Whippany, and Fred Wudl, Chester, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

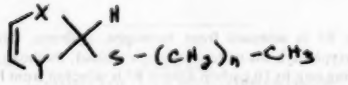
Filed Jan. 20, 1975, Ser. No. 542,246
Int. Cl.² C07D 339/06
U.S. Cl. 260—327 M 4 Claims

1. Method for the preparation of a fulvalene which comprises the steps of

a. reducing an organic halide of the general formula



with a reducing agent selected from the alkali and alkaline earth metal borohydrides at a temperature less than 15°C. wherein X is selected from the group consisting of sulfur, selenium and tellurium, Y is selected from the group consisting of sulfur and selenium, *n* is an integer from 0–4 and Z if a halogen atom, so resulting in the formation of the corresponding partially hydrogenated compound



b. reacting the partially hydrogenated derivative with fluorboric acid to yield the corresponding fluoborate derivative, and

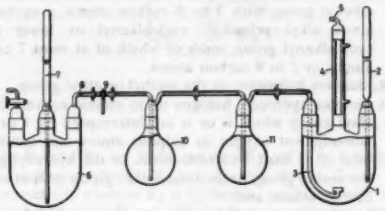
c. deprotonating the fluoborate derivative with an alkyl tertiary amine to yield the fulvalene.

3,941,810

SULFONATION OF AROMATIC COMPOUNDS IN THE PRESENCE OF SOLVENTS

Adolf Koebner, The Retreat, St. Bees, Cumberland, England

Filed Oct. 30, 1973, Ser. No. 411,053
Claims priority, application United Kingdom, Oct. 30, 1972, 49928/72
Int. Cl.² C07D 333/00; C07C 143/24
U.S. Cl. 260—329 S 4 Claims



1. A process for the sulfonation of aromatic compounds selected from the group consisting of benzene, thiophene, bromobenzene, toluene, ortho-xylene, meta-xylene, anisole, naphthalene, nitro-naphthalene, anthracene and tetrahydronaphthalene, wherein:

1. said aromatic compound is admixed with an organic solvent substantially inert to the action of sulfur trioxide under the sulfonation conditions to form a liquid mixture, and said organic solvent is admixed in a quantity of from 20% to 200% by weight based on the weight of aromatic compound, and said organic solvent is selected from the group consisting of n-pentane, n-hexane, n-heptane, isoheptane, cyclohexane, methylcyclohexane, diethyl ether, dioxane, nitromethane and 1,1,2,2-tetrachloroethane;
2. The liquid mixture is brought to boiling in a reaction chamber at a temperature of from 20°C to 100°C at a pressure of 0.1 mm Hg to atmospheric pressure;
3. gaseous sulfur trioxide is introduced into the boiling liquid mixture within the reaction chamber to react exothermically with the aromatic compopund, said aromatic compound being employed in an excess quantity to maintain the constant presence of some unreacted aromatic compound in the reaction chamber during the sulfonation reaction, heat liberated in the exothermic sulfonation reaction causing the mixture to continue to boil and furnishing the latent heat of volatilization of the matter that volatilizes;
4. the matter thus volatilized is reconverted to liquid in a heat-exchanger, so that the latent heat of volatilization is exchanged in the heat-exchanger and heat liberated in the sulfonation reaction is thus removed from the reaction chamber;
5. the volatilized matter reconverted to liquid in the heat-exchanger is recycled to the reaction chamber; and
6. the pressure in the reaction chamber and the rate at which the gaseous sulfur trioxide is introduced into the liquid mixture within the reaction chamber are so controlled that matter is volatilized, reconverted to the liquid state and recycled to the reaction chamber at such a rate as to ensure that there is always present in the mixture within the reaction chamber an amount of volatilizable matter exceeding that amount capable of being volatilized by the heat of reaction of the aromatic compound present with the gaseous sulfur trioxide in contact with said aromatic compound in the reaction chamber and that the temperature of the reaction mixture is from 20°C to 100°C.

3,941,811
OXIDATION PROCESS

Michel Vignau, Neuilly-sur-Seine, France, assignor to Roussel-UCLAF, Paris, France

Continuation of Ser. No. 265,522, June 23, 1972, abandoned. This application Feb. 11, 1974, Ser. No. 440,984
Claims priority, application France, July 1, 1971, 71.24086
Int. Cl.² C07D 311/86; C07C 49/64, 49/66, 45/16
U.S. Cl. 260—335 7 Claims

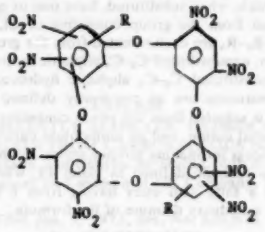
1. In a liquid phase oxidation of compounds containing a hydroxy attached to a carbon atom into the corresponding carbonyl compound, the improvement which comprises using silver silicate having the empirical formula Ag_8SiO_2 as the oxidizing agent.

3,941,812
THERMALLY STABLE OCTANITRO MACROCYCLIC EXPLOSIVES

Everett E. Gilbert, Morristown, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 10, 1975, Ser. No. 566,848
Int. Cl.² C07D 323/00
U.S. Cl. 260—338 11 Claims

1. A nitro compound of the formula



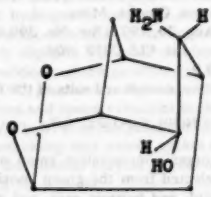
wherein R is hydrogen or lower n-alkyl and the ether oxygen atoms are attached in the 1,3 or 1,4 positions to the R substituted benzene rings, R being in the 2 or 5 positions when the ether oxygen atoms are in the 1,3 positions and R is lower n-alkyl.

3,941,813
DIOXATRICYCLODECANES AND PROCESS FOR THEIR MANUFACTURE

Robert Burns Woodward, Cambridge, Mass., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 2, 1973, Ser. No. 329,256
Claims priority, application Switzerland, May 10, 1972, 6934/72
Int. Cl.² C07D 319/06
U.S. Cl. 260—340.7 4 Claims

1. The racemic 4β-amino-9,10-dioxatricyclo[4,3,1,$0^{3,8}$]decan-5α-ol of the formula VII



(VII)

3,941,814
PROCESS FOR OBTAINING D(−)-AND L(+)-α-AZIDOPHENYLACETIC ACID

Gunter Bisen, Troisdorf-Sieglar; Hans Schubel, Munich-Waldperlach, and Gerhard Schmeling, Cologne, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Germany

Filed July 29, 1974, Ser. No. 492,927
Claims priority, application Germany, July 28, 1973, 2338471
Int. Cl.² C07C 117/00
U.S. Cl. 260—349 15 Claims

1. A process for obtaining L(+)- or D(−)-α-azidophenylacetic acid which comprises reacting a water-soluble salt of DL-α-azidophenylacetic acid with a water-soluble salt of optically active α-phenylethylamine in an aqueous medium containing solvent consisting essentially of water to produce a reaction product therein, crystallizing a diastereomeric salt of said acid and said amine from said reaction product and splitting the thus-obtained salt, said salt of optically active α-phenylethylamine being utilized in an amount of from 0.1 to 0.5 mole per mole of the salt of DL-α-azidophenylacetic acid.

3,941,815
PROCESS FOR THE PREPARATION OF 5-NITRO-1,4-NAPHTHOQUINONE

Hiroshi Koike, Takatsuki; Akio Fukui, Kyoto; Yuji Ito, Amagasaki; Takehiko Tanaka, Kobe, and Yukio Okuda, Toyonaka, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

Filed July 31, 1974, Ser. No. 493,607
Claims priority, application Japan, July 31, 1973, 48-85458; Oct. 22, 1973, 48-117991; Dec. 28, 1973, 48-144649
Int. Cl.² C07C 76/02
U.S. Cl. 260—396 R 16 Claims

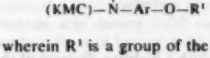
1. A process for the preparation of 5-nitro-1, 4-naphthoquinone comprising nitrating 1,4-naphthoquinone with nitric acid in the presence of sulfuric acid at a temperature of −20°C to +80°C and under the condition that the weight ratio of the total amount of sulfuric acid to the total amount of water in the reaction system is at least 4 and adding the resulting reaction mixture to an aqueous medium to precipitate the product.

3,941,816
STABILIZED OXICHROMIC COMPOUNDS

Albert Edward Anderson, Jr., Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 10, 1971, Ser. No. 206,925
Int. Cl.² C07C 103/76
U.S. Cl. 260—404.5 10 Claims

1. A compound having the formula:



wherein R^1 is a group of the formula:

wherein R^4 is an alkyl group containing from 1–6 carbon atoms or an aryl group containing from 6–12 carbon atoms; Ar is an arylene group having from about 6–20 carbon atoms; R^2 can be a hydrogen atom or the same substituents as R^1; and (KMC) is an open-chain ketomethylene color coupler containing a group of the formula:

wherein * represents the coupling position which forms a bond with the said nitrogen atom attached to Ar to provide a reduced azomethine linkage.

3,941,817

TERTIARY AMIDE AMPHOTERIC SURFACE ACTIVE AGENTS AND PROCESS FOR THEIR MANUFACTURE

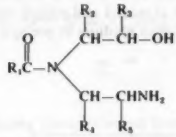
Paritosh Mohan Chakrabarti, Wayne, N.J., assignor to GAF Corporation, New York, N.Y.

Filed Sept. 3, 1974, Ser. No. 502,637

Int. Cl.² C07C *102/06*

U.S. Cl. 260—404.5 **19 Claims**

1. A tertiary amide of the formula

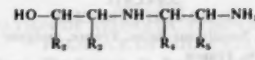


wherein:

R_1 is selected from the group consisting of unsubstituted C_5-C_{29} and substituted C_5–C_{29} aliphatic hydrocarbon radicals, which, when substituted, have one or more substituents selected from the group consisting of Cl, Br, OH and OCH_3; and R_2–R_5 are each selected from the group consisting of hydrogen unsubstituted C_2–C_4 aliphatic hydrocarbon radicals, and substituted C_2–C_4 aliphatic hydrocarbon radicals whose substituents are as previously defined for R_1.

5. A process for making tertiary amides of the formula as defined in claim **1**, which comprises condensing a fatty acid ester having the acyl radical

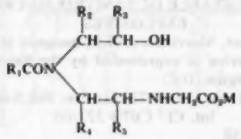
and from 6 to 30 carbon atoms with a hydroxy diamine of the formula:



wherein: R_2–R_5 are as defined in claim **1**, for from 5 minutes to an hour in the presence of a base catalyst and at a temperature between 60° and 120°C until the formation of the tertiary amide; and recovering the tertiary amide formed with the acyl radical

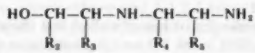
derived from said fatty acid ester.

11. Amphoteric surface active agents of the formula:



wherein R_1 is selected from the group consisting of unsubstituted C_5–C_{29} and substituted C_5–C_{29} aliphatic hydrocarbon radicals, which, when substituted, have one or more substituents selected from the group consisting of Cl, Br, OH and OCH_3; and R_2–R_5 are each selected from the group consisting of hydrogen, unsubstituted C_2–C_4 aliphatic hydrocarbon radicals, and substituted C_2–C_4 aliphatic hydrocarbon radicals whose substituents are as previously defined for R_1; and wherein M is selected from the group consisting of hydrogen, an alkali metal cation, and an ammonium cation.

13. A process for making tertiary amide amphoteric surfactants of the formula defined in claim **11**, which comprises condensing a fatty acid ester having from 6 to 30 carbon atoms with a hydroxy diamine of the formula:



wherein:

R_2–R_5 are as defined in claim **1**, for from 5 minutes to an hour in the presence of a base catalyst and at a temperature between 60° and 120°C, until formation of the tertiary amide, and reacting the reaction product containing said amide with an acidic material selected from the group consisting of

and salts thereof wherein R_6 is selected from the group consisting of hydrogen and C_1–C_4 alkyl to form said surfactants.

3,941,818

1:1 ZINC METHIONINE COMPLEXES

Mahmoud M. Abdel-Monem, Minneapolis, Minn., assignor to Zinpro Corporation, Chaska, Minn.

Filed Aug. 20, 1973, Ser. No. 390,080

Int. Cl.² C07F *3/06*

U.S. Cl. 260—429.9 **21 Claims**

1. Zinc methionine, complexed salts of the formula:

$$[CH_3SCH_2CH_2CH(NH_2)COO^- Zn^{++}]_wX$$

wherein X is an organic monovalent anion of a monobasic carboxylic acid selected from the group consisting of acetic acid, propionic acid, and benzoic acid, and w is an integer equal to the anionic charge of X.

2. Zinc methionine, complexed salts of the formula:

$$[CH_3SCH_2CH_2CH(NH_2)CO\overline{O} - Zn^{++}]_wX$$

wherein X is an inorganic anion selected from the group consisting of halides, sulfates, and phosphates, and *w* is an integer equal to the anionic charge of X.

3,941,819

CATALYTIC FORMATION OF HYDROCARBONS FROM CO HYDROGEN MIXTURES

M. Albert Vannice, Plainfield, and Robert Lee Garten, Summit, both of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 424,861, Dec. 13, 1973. This application Dec. 30, 1974, Ser. No. 537,580

Int. Cl.² C07C *27/06*

U.S. Cl. 260—449 R **1 Claim**

1. A process for producing substantial amounts of dimethyl ether, said process comprising the step of passing CO and H_2 over platinum supported on alumina, wherein the amount of platinum ranges from 0.3 to 2 wt. % based on total weight of the support including platinum at a temperature ranging from 200° to 300°C and a pressure ranging from 10.10 to 40 atmospheres and wherein the mol rato of hydrogen to CO ranges from 0.1 to 2.

3,941,820

PREDOMINANTLY ALIPHATIC HYDROCARBON MATERIALS FROM CARBONACEOUS SOLIDS

Robert G. Jackson, and Charles M. Starks, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Jan. 9, 1975, Ser. No. 539,678

Int. Cl.² C07C *27/06*

U.S. Cl. 260—449.6 **8 Claims**

1. A process comprising:

a. gasifying carbonaceous solids with from about 0.1 to about 3 pounds of steam per pound of said solids at temperatures in the range of 500°C to 2100°C and pressures of atmospheric to 1000 atmospheres to produce a gasification product stream containing a mixture of water, carbon dioxide, carbon monoxide, hydrogen, sulfur compounds and hydrocarbon materials of a predominantly aliphatic type,

b. combining the gasification product stream with an internal recycle stream rich in hydrocarbon materials of a predominantly aliphatic type to form a crude product stream,

c. removing water, carbon dioxide and sulfur compounds from the crude product stream to form a purified product stream containing essentially only hydrocarbon materials, carbon monoxide and hydrogen,

d. cooling the purified product stream to liquefy, separate and recover the hydrocarbon materials from the carbon monoxide and hydrogen,

e. directly introducing the carbon monoxide and hydrogen to a catalytic reaction zone and reacting the carbon monoxide and hydrogen in said zone to produce an internal recycle stream rich in hydrocarbon materials of a predominantly aliphatic type, said reaction being conducted under conditions of temperatures in the range of about 150°to 450°C, pressures in the range of atmospheric to 75 atmospheres and space velocities in the range of 500 to 50,000 V/V/hr STP, in the presence of a Fischer-Tropsch catalyst containing iron, cobalt, nickel or ruthenium, and

f. recycling the internal recycle stream of step (e) back to step (b) of the process.

3,941,821

2-THIOSULFO BIPHENYLYLACETIC ACIDS

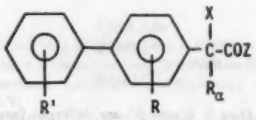
Julius Diamond, Lafayette Hill, and Norman Julian Santora, Roslyn, both of Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

Division of Ser. No. 152,366, June 11, 1971, Pat. No. 3,821,268, which is a continuation-in-part of Ser. No. 34,870, May 5, 1970. This application Mar. 8, 1974, Ser. No. 449,548

Int. Cl.² C07C *161/05*

U.S. Cl. 260—453 R **11 Claims**

1. A compound of the formula:



where:

R_α is hydrogen or loweralkyl;

R' and R are hydrogen or not more than one of R or R' at the same time is

halo,
nitro,
amino,
acylamino,
mono- and diloweralkylamino,
mercapto,
acylthio,
loweralkylthio,
loweralkylsulfinyl,
loweralkylsulfonyl,
hydroxy,
loweralkoxy,
acyloxy,
haloloweralkyl,
cyano,
acetyl or
loweralkyl;

X is

thiosulfo;

and

Z is —OH or

—OM where M is an alkali, alkaline earth or aluminum metal or an ammonium salt.

3,941,822

PROCESS FOR THE PREPARATION OF METHYLENE-BRIDGED DIARYL ISOCYANATES

John S. Babiec, Jr., Orange, and Wilhelm J. Schnabel, Branford, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Oct. 3, 1974, Ser. No. 511,589

Int. Cl.² C07C *118/00*, *119/048*

U.S. Cl. 260—453 P **12 Claims**

1. In a process for preparing methylene-bridged diaryl isocyanates by reacting an α-halomethyl aromatic compound with an aromatic isocyanate at a temperature in the range of from about 100° to about 250° C., and in the presence of a catalyst, the improvement which comprises employing as said catalyst a zinc, cadmium or mercury salt of an aliphatic carboxylic acid having 1–20 carbon atoms or a cycloaliphatic carboxylic acid having 4–20 carbon atoms.

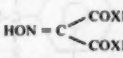
3,941,823

METHOD FOR PRODUCING ISONITROSOMALONIC ESTERS

Naoto Hashimoto; Masaaki Kuritani, and Noriaki Toukai, all of Osaka, Japan, assignors to Takeda Chemical Industries, Ltd., Japan

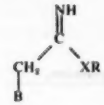
Filed Oct. 18, 1973, Ser. No. 407,628
Claims priority, application Japan, Oct. 24, 1972, 47-106472
Int. Cl.² C07C *153/09*
U.S. Cl. 260—455 R 11 Claims

1. A method for the production of a compound of the formula of



(II)

wherein X is O or S, R and R¹ are different from each other and represent a straight chain, branched or cyclic alkyl having up to 20 carbon atoms, which are unsubstituted or substituted by chlorine or bromine, which comprises reacting a compound of the formula:



(I)

wherein B is -COOR¹ or

and X, R and R¹ have the same meaning as defined above, which a nitrosating agent in an amount at least equal to the sum of one molecular equivalent for the methylene group and one molecular equivalent per imidate or thioimidate group of the compound of the formula (I), said reaction being conducted with cooling or at room temperature, in a solvent.

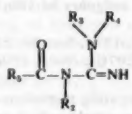
3,941,824

HERBICIDAL CARBAMATES AND THIOLCARBAMATES

Julius Jakob Fuchs, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Division of Ser. No. 356,422, May 2, 1973, which is a continuation-in-part of Ser. No. 312,904, Dec. 7, 1972. This application Apr. 10, 1975, Ser. No. 566,713
Int. Cl.² C07C *155/02*
U.S. Cl. 260—455 A 1 Claim

1. A compound having the formula



where

R_2 is C_1-C_3 alkyl;

R_3 is hydrogen, methyl, or ethyl;

R_4 is C_1-C_4 alkyl, C_2-C_4 alkenyl, C_2-C_4 alkynyl, or methoxyl;

R_5 is OR_6 or SR_6 where R_6 is C_1-C_4 alkyl substituted with 0–3 chlorine atoms or 0–1 methoxyl.

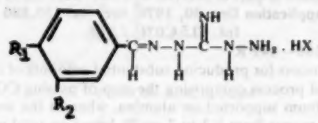
3,941,825

SUBSTITUTED AMINOBENZYLIDENEAMINO GUANIDINE COMPOUNDS

Andrew Stephen Tomcufcik, Old Tappan, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 383,419, July 27, 1973, Pat. No. 3,901,944, which is a continuation-in-part of Ser. No. 251,096, May 8, 1972, abandoned, which is a continuation-in-part of Ser. No. 94,591, Dec. 2, 1970, Pat. No. 3,769,432, which is a continuation-in-part of Ser. No. 833,167, June 13, 1969, abandoned, which is a continuation-in-part of Ser. No. 741,247, July 1, 1968, abandoned. This application Nov. 7, 1974, Ser. No. 521,716
Int. Cl.² C07C *133/12*
U.S. Cl. 260—465 E 6 Claims

1. A substituted guanidine of the formula:



wherein R_1 is selected from the group consisting of halogen, trifluoromethyl, trifluoromethoxy and cyano, R_2 is hydrogen or chlorine and X is the anion of pharmacologically acceptable acid.

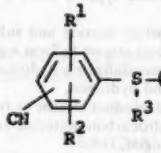
3,941,826

(CYANO-DIALKYLPHENYL) ALKYL SULFIDES, SULFOXIDES AND SULFONES

Elmore Louis Martin, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 394,825, Sept. 6, 1973, Pat. No. 3,879,472. This application Feb. 24, 1975, Ser. No. 552,034
Int. Cl.² C07C *121/52*
U.S. Cl. 260—465 R 6 Claims

1. The compounds having the structure



wherein

R^1 and R^2, alike or different, are alkyl of 2 to 7 carbon atoms in which there are no more than 3 carbons in a line from the aromatic ring;

R^3 is an alkyl of 1 to 3 carbon atoms; and

n is O, 1 or 2

with the provisos that:

1. R^1 and R^2 are not ortho to each other,
2. at least one of R^1 and R^2 contains at least 3 carbon atoms, and
3. CN is not ortho to the

$-S(\rightarrow O)_n$ group.
R^3

3,941,827

PREPARATION OF HALOGENATED NITRILES

Robert Phillip Johnson, Alma, Mich., assignor to Michigan Chemical Corporation, Chicago, Ill.

Filed Feb. 4, 1974, Ser. No. 439,470
Int. Cl.² C07C *120/04*
U.S. Cl. 260—465.7 13 Claims

1. A process for preparing 4-halobutyronitrile wherein said nitrile is 4-chlorobutyronitrile, 4-bromobutyronitrile or mixtures thereof comprising reacting a water ionizable metal or ammonium cyanide with 1-chloro-3-bromopropane, in a molar ratio of 1-chloro-3-bromopropane to cyanide of about 1:1 to about 2:1, the reaction medium being water, and in the presence of a phase transfer catalyst, the reaction temperature being maintained at about 50° to about 100°C.

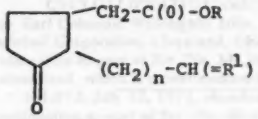
3,941,828

PROCESS FOR THE PREPARATION OF CYCLIC KETONES

George Hermann Buchi, Cambridge, Mass., assignor to Firmenich SA, Geneva, Switzerland

Continuation of Ser. No. 201,168, Nov. 22, 1971, abandoned. This application May 21, 1974, Ser. No. 471,840
Claims priority, application Switzerland, Dec. 9, 1970, 18303/70; Nov. 12, 1971, 16493/71
Int. Cl.² C07C *61/38*, *69/74*
U.S. Cl. 260—468 K 10 Claims

1. A process for the preparation of cyclic ketones having the formula



I

wherein the symbol (=R^1) represents an alkylidene radical containing one to five carbon atoms, R indicates a lower alkyl radical having a linear or a branched chain, and *n* stands for the integer 0, 1, 3 or 4, which comprises:

a. alkylating cyclohexane-1,3-dione by treating it with an alkyne halide of formula

$$X-(CH_2)_n-C(\equiv R^2) \qquad II$$

wherein X represents a halogen, ($\equiv R^2$) represents an alkylidyne radical containing one to five carbon atoms, and *n* stands for the integer 0, 1, 3 or 4;

b. reacting the obtained 2-alkynyl-cyclohexane-1,3-dione with a halogenating agent;

c. treating the resulting 2-halo-2-alkynyl-cyclohexane-1,3-dione in a solvent selected from the group of methyl-, ethyl-, and isopropyl alcohol, tetrahydrofurane, dioxane, dimethylformamide, anhydrous xylene and mesitylene, with a mineral or an organic base selected from the group of trimethylamine, triethylamine, N,N-diisopropylethylamine, pyridine, α-, β-, or γ- collidine, ethyl pyridine, picoline, lutidine, alkali metal hydroxides, and alkali metal carbonates and bicarbonates, at a temperature from about 15° to about 200°C, for obtaining a 2-alkynyl-cyclopent-2-enone;

d. adding on to the cyclic double bond of the obtained ketone a dialkyl malonate in the presence of a base catalyst;

e. hydrolysing and subsequently decarboxylating the dialkyl 2-alkynyl-3-oxo-cyclopentyl malonate, obtained according to (d), by treating it successively with a base and an acid;

f. esterifying the 2-alkynyl-3-oxo-cyclopentyl acetic acid obtained, and

g. partially hydrogenating the resulting ester in the presence of a partially poisoned hydrogenation catalyst.

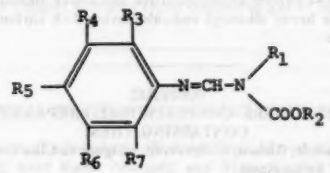
3,941,829

N-PHENYL-N'-CARBOPHENOXY FORMAMIDINES

Georg Pissiotas, Lorrach, Germany, and Dieter Dürr, Bottmingen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 1, 1972, Ser. No. 311,058
Claims priority, application Switzerland, Dec. 7, 1971, 17790/71; Dec. 7, 1971, 17791/71; Jan. 26, 1972, 1224/72; Oct. 27, 1972, 15729/72
Int. Cl.² C07C *125/06*
U.S. Cl. 260—471 C 6 Claims

1. A compound of the formula



wherein R_1 represents hydrogen, C_1-C_4 alkyl, C_3-C_5 alkenyl or C_3-C_5 alkynyl, R_2 represents α-naphthyl, or phenyl substituted by halogen, C_1-C_5 alkyl, C_1-C_4 haloalkyl, C_1-C_4 alkoxy, alkoxyalkyl having 1 to 4 carbon atoms in each of the alkyl moieties, C_1-C_4 alkylthio, C_3-C_4 alkynyloxy, dialkylamino having C_1-C_4 alkyl groups, dialkenylamino having C_3-C_4 alkenyl groups, dialkynylamino having C_3C_4 alkynyl groups, N-lower alkyl-N-(C_3-C_4)alkynylamino, N-lower alkyl-N-(C_3-C_4)alkenylamino, OH, CN, NO_2, cyclopentyl, monomethylaminomethyleneimino, dimethylaminomethyleneimino, 1,3-dioxolan, 1,3-dithiolan, and 4,5-dimethyl-1,3-dioxolan

wherein the phenyl group is not substituted simultaneously in the 2-position by a methyl group and in the 4-position by a chlorine atom, and R_3, R_4, R_5, R_6 and R_7 represent one or more radicals which are the same or different, selected from hydrogen, halogen atoms or C_1-C_4 alkyl, C_1-C_4 alkoxy, C_1-C_4 alkylthio, C_3-C_5 alkenyloxy, C_3-C_5 alkynyloxy, CF_3, or nitro groups.

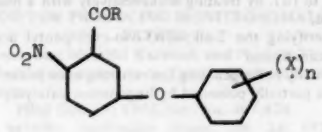
3,941,830

SUBSTITUTED PHENOXYBENZOIC ACIDS AND ESTERS THEREOF

Robert J. Theissen, Westfield, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 114,712, Feb. 11, 1971, Pat. No. 3,784,635, which is a continuation-in-part of Ser. No. 819,412, April 25, 1969, Pat. No. 3,652,645. This application Sept. 19, 1973, Ser. No. 398,610
Int. Cl.² C07C *69/78*, *79/46*
U.S. Cl. 260—471 R 5 Claims

1. A compound having the formula:



wherein X is halogen, C_1-C_4 alkyl, or NO_2 and at least one X is halogen and another is C_1-C_4 alkyl or NO_2; R is hydroxy or alkoxy of 1 to 5 carbon atoms; and n is 2 to 5.

3,941,831

RESOLUTION OF ALKYL ESTERS OF DL-PHENYLALANINE

Paul B. Sollman, Wilmette, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Filed Sept. 10, 1973, Ser. No. 395,940

Int. Cl.² C07C *103/32*

U.S. Cl. 260—471 A **10 Claims**

1. In a process for resolving alkyl esters of DL-phenylalanine, the step which comprises contacting a lower alkyl ester of DL-phenylalanine with N-(lower alkanoyl)-D-phenylalanine, wherein lower alkyl comprehends lower alkyl radicals having 1–4 carbon atoms inclusive and lower alkanoyl comprehends lower alkanoyl radicals having 1–8 carbon atoms inclusive.

3,941,832

OXIME ETHERS AND PESTICIDAL PREPARATIONS CONTAINING THEM

Adolf Hubele, Riehen, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

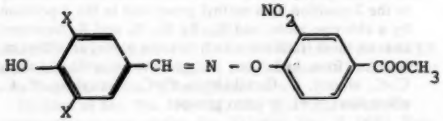
Division of Ser. No. 339,247, March 8, 1973, Pat. No. 3,876,697, which is a division of Ser. No. 46,832, June 16, 1970, Pat. No. 3,733,359, which is a continuation-in-part of Ser. No. 521,413, Jan. 18, 1966, abandoned. This application Jan. 23, 1975, Ser. No. 543,582

Claims priority, application Switzerland, Jan. 22, 1965, 915/65; July 9, 1965, 9630/65

Int. Cl.² C07C *101/00*

U.S. Cl. 260—471 R **1 Claim**

1. A compound of the formula



in which X is chlorine, bromine or iodine.

3,941,833

AMINO DERIVATIVES OF 2,2-DIARYL-CYCLOPROPANE

Jean-Claude Gognaco, Garches, France, assignor to Societe Anonyme dite: HEXACHIMIE, France

Filed Nov. 19, 1973, Ser. No. 417,128

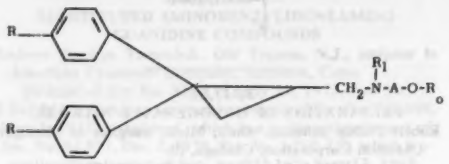
Claims priority, application United Kingdom, Nov. 30, 1972, 55277/72

Int. Cl.² C07C *93/24*

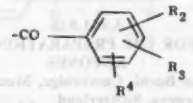
U.S. Cl. 260—472 **9 Claims**

1. 2,2-diarylcyclopropane derivatives selected from the group consisting of:

a. the compounds corresponding to the formula:



in which R represents H, Cl, F, CH_3, OCH_3; A represents C_1–C_5 alkylene group, R_1 represents H, CH_3; R_6 is a benzoyl group of the formula



in which R_2, R_3 and R_4, which may be the same or different, each represent H, Cl, NO_2, CH_3, OCH_3.

3,941,834

HIGH MOLECULAR WEIGHT ALIPHATIC HYDROCARBON SULFONIC ACIDS, SULFONYL CHLORIDES AND SULFONAMIDES

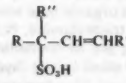
Richard J. Lee, Downers Grove, Ill., assignor to Standard Oil Company, Chicago, Ill.

Filed June 9, 1971, Ser. No. 151,544

Int. Cl.² C07B *13/00*

U.S. Cl. 260—504 R **4 Claims**

1. An aliphatic hydrocarbon sulfonic acid of the structure:



wherein R is an alkyl hydrocarbon group, R′ and R″ are alkyl hydrocarbon group of 1 to 5 carbon atoms and the sum of the weights of R, R′ and R″ is a 300–3000 Mn.

3,941,835

RECOVERY OF L-DOPA FROM R-DOPA CONTAINING MATERIALS

Guy J. Riccardi, Freeport, N.Y., assignor to Bio-Derivatives Corporation, Deer Park, N.Y.

Filed Mar. 19, 1970, Ser. No. 21,072
Int. Cl.² C07C *101/77*
U.S. Cl. 260—519 19 Claims

1. A method for the recovery of L-Dopa from L-Dopa-containing material which comprises extracting L-Dopa from said material by contacting said material with substantially acid-free water, separating the resulting aqueous extract, now containing L-Dopa dissolved therein, from the resulting extracted material, concentrating the resulting aqueous extract with the removal of at least about 50% of the water content therefrom and separating L-Dopa from the resulting concentrated aqueous extract by crystallization.

19. A method for recovering 3-(3,4-dihydroxyphenyl)-L-alanine from comminuted beans containing it, which comprises the steps of contacting said beans with a reagent consisting essentially of liquid water at a temperature in the range about 5°–100°C. for a period of time to dissolve a substantial portion of the 3-(3,4-dihydroxyphenyl)-L-alanine therein, separating the extract phase from the beans and recovering a 3-(3,4-dihydroxyphenyl)-L-alanine product.

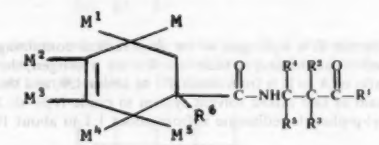
3,941,836

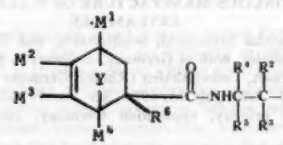
CYCLOALIPHATIC CARBOXAMIDES

Lester Earl Coleman, Willoughby Hills, Ohio, assignor to The Lubrizol Corporation, Cleveland, Ohio

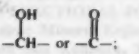
Continuation-in-part of Ser. No. 341,008, March 14, 1973, abandoned, which is a continuation-in-part of Ser. No. 161,972, July 12, 1971, abandoned, which is a continuation-in-part of Ser. No. 40,457, May 25, 1970, abandoned, which is a division of Ser. No. 691,698, Dec. 19, 1961, Pat. No. 3,549,340. This application Nov. 20, 1973, Ser. No. 417,655
Int. Cl.² C07C *103/19*
U.S. Cl. 260—557 R 16 Claims

1. A compound having one of the formulas

(I) 

(II) 

wherein each of M, M^1, M^2, M^3, M^4 and M^5 is hydrogen, methyl or halo with the proviso that no more than three of the M values are other than hydrogen; each of R^1, R^2, R^3, R^4, R^5 and R^6 is hydrogen or lower alkyl; R^o is



and Y is CH_2 or CCl_2.

3,941,837

METHOD OF TREATING AN AQUEOUS SOLUTION OF ACRYLAMIDE

Shiro Asano; Kiyotaka Yoshimura, and Masao Hashimoto, all of Mobara, Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed May 28, 1974, Ser. No. 473,551
Claims priority, application Japan, June 5, 1973, 48-62511
Int. Cl.² C07C *103/08*
U.S. Cl. 260—561 N 18 Claims

1. In a method of purifying an aqueous solution of acrylamide containing from 1 to 1,000 ppm of cuprous ions wherein said aqueous solution is subjected to at least one of the steps of distillation, concentration, filtration, precipitation, treatment with active carbon, crystallization and ion-exchange treatment, the improvement wherein at least one of said steps is preformed in a manner that said aqueous solution does not come in contact with an oxygen containing gas or liquid.

3,941,838

PARTIAL DEHYDRATION OF CYCLOHEXANONE OXIME

Hugo Fuchs, Ludwigshafen; Rudolph Gath, Mannheim, Vogelstang; Kurt Kahr, Neustadt, and Klaus Kartte, Beindersheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Jan. 30, 1974, Ser. No. 438,167
Claims priority, application Germany, Feb. 1, 1973, 2304766
Int. Cl.² C07C *131/04*
U.S. Cl. 260—566 A 10 Claims

1. A process for the partial dehydration of cyclohexanone oxime by treatment with aqueous solutions of inorganic salts, wherein the crude cyclohexanone oxime is extracted, above its melting point, with a concentrated solution of an ammonium and/or hydroxylammonium salt of a mineral acid in countercurrent in an extraction column and the salt solution is then separated from the partly dehydrated cyclohexanone oxime, re-concentrated by evaporation and recycled to the oxime dehydration process, wherein the cyclohexanone oxime which has been dehydrated to water contents of about 4 to 6% by weight is treated with a heated inert gas above its melting point and the gas is washed to remove entrained cyclohexanone oxime.

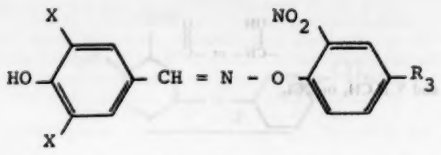
3,941,839

OXIME ETHERS AND PESTICIDAL PREPARATIONS CONTAINING THEM

Adolf Hubele, Riehen, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Division of Ser. No. 339,247, March 8, 1973, Pat. No. 3,876,697, which is a division of Ser. No. 46,832, June 16, 1970, Pat. No. 3,733,359, which is a continuation-in-part of Ser. No. 521,413, Jan. 18, 1966, abandoned. This application Jan. 23, 1975, Ser. No. 543,583
Claims priority, application Switzerland, Jan. 22, 1965, 915/65; July 9, 1965, 9630/65
Int. Cl.² C07C *131/08*
U.S. Cl. 260—566 AE 1 Claim

1. A compound of the formula



in which X is chlorine, bromine or iodine; and R_3 is trifluoromethyl or formyl.

3,941,840

PROCESS FOR PRODUCING KETOXIMES

Cornel Constantin N. Rotaru, Piatra Neamt, Romania, assignor to Centrala Industriala de Fibre Chimice, Piatra Neamt, Romania

Filed Sept. 15, 1972, Ser. No. 289,226
Claims priority, application Italy, Sept. 24, 1971, 68278/71
Int. Cl.² C07C *131/10*
U.S. Cl. 260—566 A 6 Claims

1. A process for the production of cyclohexanone oxime comprising the steps of:

a. mixing nitrogen monoxide and hydrogen with planetary agitation in the presence of a platinum catalyst in a mineralacid medium in the form of a solution of ammonium hydrogen sulfate or phosphate to reduce said nitrogen monoxide and produce a mixture of hydroxylamine, ammonium and hydroxylammonium salts;

b. reacting said mixture with cyclohexanone while concomitantly raising the pH value of the mixture by adding ammonia thereto to produce the cyclohexanone oxime; and

c. separating the cyclohexanone oxime from the ammonium salt solution.

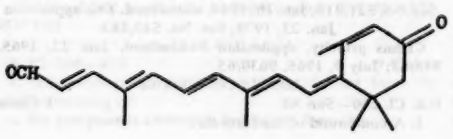
3,941,841

METHOD FOR SYNTHESIZING RHODOXANTHIN

Joseph Donald Surmatis, and Armin Walser, both of West Caldwell, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. Nos. 153,090, June 14, 1971, Pat. No. 3,830,844, and Ser. No. 826,022, May 19, 1969, Pat. No. 3,624,105, which is a division of Ser. No. 617,827, Feb. 23, 1967, Pat. No. 3,466,331. This application May 17, 1974, Ser. No. 471,089
Int. Cl.² C07C *49/48*
U.S. Cl. 260—586 R 1 Claim

1. A compound of the formula



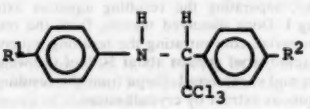
3,941,842

P,P-DISUBSTITUTED α-TRICHLOROMETHYLBENZYLANILINES

Robert L. Metcalf; Inder Kapoor, and Asha Hirwe, all of Urbana, Ill., assignors to The University of Illinois Foundation, Urbana, Ill.

Filed Dec. 26, 1972, Ser. No. 318,085
Int. Cl.² C07C *87/29*
U.S. Cl. 260—570.5 R 17 Claims

1. The compounds having the formula



where R^1 and R^2 are selected from the group consisting of substituents Cl, CH_3, CH_3O, C_2H_5O, $N(CH_3)_2$, O_2N, C_4H_9O, and C_6H_{11}.

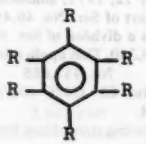
3,941,843

PURIFICATION OF N,N-DI-2-NAPHTHYL-P-PHENYLENEDIAMINE USING A MIXED SOLVENT SYSTEM

George Kletecka, Rocky River, and Mark E. Forry, Columbus, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed May 16, 1974, Ser. No. 470,436
Int. Cl.² C07C *87/58*
U.S. Cl. 260—576 8 Claims

1. A process for purifying crude N,N′-di-2-naphthyl-p-phenylenediamine wherein crude N,N′-di-2-naphthyl-p-phenylenediamine is contacted with a mixed solvent system comprising (A) at least one compound selected from the group consisting of alkanols and alkanediols containing from 1 to 5 carbon atoms, and (B) at least one alkylated benzene having the formula



wherein R is hydrogen or an alkyl radical containing 1 to 3 carbon atoms and at least two R's are hydrogen, the weight ratio of A to B is from about 1:1 to about 1:9, and the weight ratio of said mixed solvent system to crude N,N′-di-2-naphthyl-p-phenylenediamine is from about 1:1 to about 10:1.

3,941,844

CONTINUOUS MANUFACTURE OF N-ALKYLATED ARYLAMINES

Hans Joachim Szymanski, Schifferstadt, and Toni Dockner, Meckenheim, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed July 25, 1974, Ser. No. 491,626
Claims priority, application Germany, July 28, 1973, 2338419
Int. Cl.² C07C *87/62*
U.S. Cl. 260—577 7 Claims

1. An improved process for the continuous manufacture of N-alkylated arylamines by reaction of arylamines which have at least one hydrogen atom on the nitrogen, with olefins having 2–10 carbon atoms or cycloolefins having 5 to 8 carbon atoms, which can have substituents which are inert under the

reaction conditions, at temperatures from 180° to 450°C, in the presence of catalysts, wherein the improvement comprises using silicic acid which contains from 0.1 to 30 percent by weight of phosphoric acid, based on silicic acid, as the catalyst and catalytic amounts of water of 0.1 to 30 mole percent, based on the arylamine, and feeding phosphoric acid or a phosphoric acid alkyl ester continuously to the catalyst during the reaction.

3,941,845

PROCESS FOR PREPARING CYCLOALKANONES AND CYCLOALKANOLS

Willem Voskuil, Sittard, and Joseph J. M. van der Donck, Geleen, both of Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Filed Oct. 19, 1973, Ser. No. 408,049

Claims priority, application Netherlands, Oct. 21, 1972, 7214299

Int. Cl.² C07C *27/04, 29/00, 45/00*

U.S. Cl. 260—586 R **7 Claims**

1. In a process for the preparation of a corresponding cycloalkanone and cycloalkanol by heterogeneous catalytic liquid phase conversion of a cycloalkylhydroperoxide, having 5 to 12 carbon atoms in the ring, the improvement which comprises using a heterogeneous catalyst comprising copper (II)-chromiumoxide in a cycloalkane or aromatic hydrocarbon distributing agent at a temperature of at least 30° C. and below 160° C.

3,941,846

PREPARATION OF NITROCARBONYL COMPOUNDS

John M. Larkin, Wappingers Falls, N.Y., assignor to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 706,760, Feb. 20, 1968, abandoned. This application Apr. 19, 1971, Ser. No. 135,468

Int. Cl.² C07C *49/06, 47/02*

U.S. Cl. 260—593 R **19 Claims**

1. A method of preparing a saturated nitrocarbonyl compound having at least 4 carbon atoms and corresponding to the formula:

which consists essentially of contacting in a non-aqueous liquid environment a dinitroalcohol having at least 5 carbon atoms and corresponding to the formula:

where R is hydrogen or an alkyl group having from 1 to 20 carbon atoms and where R^{1-8} are hydrogen or alkyl groups having from 1 to 10 carbon atoms with an agent selected from the group consisting of oxides, hydroxides and salts of weak acids of the metals sodium, potassium, lithium, magnesium, calcium, strontium, barium, copper, zinc, aluminum, manganese and cobalt and basic nitrogen compounds consisting of ammonia, ammonium carbonate, triethylamine, triethanolamine, benzyltrimethylammonium hydroxide and benzyltrimethylammonium acetate, where said contacting is conducted at a temperature of from about 0° to 200°C. when R^8 is an alkyl group and at a temperature of between 100° to 160°C. when R^8 is hydrogen.

3,941,847

ALDEHYDE FUNCTIONAL POLYMERS

Toshio Yukuta, Kodaira; Minoru Kojima, Hachioji; Akira Onishi, Kodaira, and Shu Kanbara, Tokyo, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Apr. 23, 1973, Ser. No. 353,839

Claims priority, application Japan, Apr. 22, 1972, 47-40728

Int. Cl.² C07D *47/02*

U.S. Cl. 260—601 R **3 Claims**

1. Aldehyde functional polybutadiene having

a. a molecular weight from 500 to 50,000;

b. infrared absorption due to aldehyde functional groups at 1,730 cm^{-1} and 2,720 cm^{-1};

c. proton absorption at 9.8 ppm in its nuclear magnetic resonance spectrum with tetramethylsilane as a standard in a 20% by weight solution in deuterochloroform; and

containing substantially only aldehyde functional groups at chain terminals and/or on the side chains of the molecule.

3,941,848

MANUFACTURE OF PREDOMINANTLY STRAIGHT-CHAIN ALDEHYDES

Rudolf Kummer, Frankenthal; Hans-Juergen Nienburg, Ludwigshafen; Heinz Hohenschutz, Mannheim; Max Strohmeyer, and Theo Teutsch, both of Limburgerhof, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed July 24, 1973, Ser. No. 382,277

Claims priority, application Germany, July 29, 1972, 2237373

Int. Cl.² C07C *45/08*

U.S. Cl. 260—604 HF **10 Claims**

1. In an improved process for the manufacture of predominantly straight-chain aldehydes by hydroformylation of olefinically unsaturated compounds of 2 to 20 carbon atoms with carbon monoxide and hydrogen in which, in a first stage; aqueous cobalt salt solutions are treated with carbon monoxide and hydrogen at a temperature of 50° to 200°C and a pressure of 100 to 400 atmospheres in the presence of active charcoal, zeolites or basic ion exchangers which are charged with cobalt carbonyl, in a second stage cobalt carbonylhydride is extracted from the resultant reaction mixture at a temperature of 20° to 180°C and a pressure of 1 to 400 atmospheres by means of olefinically unsaturated compounds which are water-insoluble and liquid under the conditions used, the aqueous phase is separated from said liquid olefinically unsaturated compounds containing extracted cobalt carbonyl-hydride, and latter liquid is transferred to a third stage and in this stage, after introducing olefinically unsaturated compounds if the latter have only been used partially for the extraction, the hydroformylation is carried out at a temperature of 70° to 170°C and under a pressure of 100 to 400 atmospheres, the improvement comprising carrying out the extraction in the second stage as a cocurrent extraction while maintaining turbulent flow of said aqueous phase and said liquid olefinically unsaturated compounds during said cocurrent extraction.

3,941,849

POLYETHERS AND METHOD FOR MAKING THE SAME

Robert Johnston Herold, Akron, Ohio, assignor to The General Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 269,631, July 7, 1972, Pat. No. 3,829,505, which is a continuation of Ser. No. 13,733, Feb. 24, 1970, abandoned, which is a continuation-in-part of Ser. No. 479,333, Aug. 12, 1965, abandoned. This application May 10, 1974, Ser. No. 468,895

Int. Cl.² C07C *43/20, 147/10*

U.S. Cl. 260—607 A **10 Claims**

1. The method of making polyethers having at least one terminal hydroxyl group and an average molecular weight of between about 300 and 150,000 which comprises:

1. polymerizing in the liquid state at a temperature of from about 0° to 180°C at least one polymerizable organic cyclic oxide monomer selected from the group consisting of ethylene oxide; 1,2-propylene oxide; 1,2-butene oxide; 1,2-dodecane monoxide; isobutylene monoxide; styrene oxide; 1,2-pentene oxide; isopentene oxide, 1,2-diisobutylene oxide; 1,2-hexene oxide; 1,2-heptene oxide; allyl glycidyl ether; isoheptene oxide; 1,2-octene oxide; 1,2-nonene oxide; 1,2-decene oxide; 1,2-hendecene oxide; methyl glycidyl ether; ethyl glycidyl ether; phenyl glycidyl ether; butadiene monoxide; isoprene monoxide; oxetane, tolyl glycidyl ether; 3,3-dimethyl oxetane; 3-n-nonyl oxetane; 3-allyl-3-methyl oxetane; 3-vinyl-3-methyl oxetane; 1,2-pentadecene oxide; 3,3-diethyl oxetane; 3-ethyl-3-butyl oxetane; 3-chloromethylene oxetane; 3-chloromethyl-3-methyl oxetane and 3-methyl-3-ethyl oxetane with
2. at least one telogen selected from the group consisting of phenol; p-monochlorophenol; p-cresol; thymol; xylenol; hydroquinone; resorcinol;

phloroglucinol; o-, m- or p-hydroxy styrene; saligenin; bisphenol A; bisphenol F; 4,4'-dihydroxy diphenyl; 4,4'-dihydroxy diphenyl sulfone; 4,6,4'-trihydroxy diphenyl dimethyl methane; and long chain bisphenols and novolac resins of molecular weight up to 4000 having a plurality of OH groups; in admixture with

3. a double metal cyanide complex catalyst in an amount of from 0.001 to 15% by weight of said monomer, said catalyst having the general formula: $M_a(K)_c.(H_2O)_d.(R)_e$ where K is selected from the group consisting of:

$M'(CN)_b$ and $M'[(CN)_r(X)_t]_b$

where M is at least one metal selected from the group consisting of Zn(II), Fe(II), Fe(III), Co(II), Ni(II), Mo(IV), Mo(VI), Al(III), V(IV), V(V), Sr(II), W(IV), W(VI), Mn(II) and Cr(III),

where M' is at least one metal selected from the group consisting of Fe(II), Fe(III), Co(II), Co(III), Cr(II), Cr(III), Mn(II), Mn(III), V(IV), and V(V),

where X is at least one material selected from the group consisting of F^-, Cl^-, Br^-, I^-, OH^-, NO, $O^=$, CO, H_2O, NO_2^-, $C_2O_4^=$, $SO_4^=$, CNO^-, CNS^-, NCO^-, and NCS^-,

where R is an organic material containing 1 to 18 carbon atoms substantially water miscible selected from the group consisting of alcohols, aldehydes, ketones, esters, ethers, amides, nitriles and sulfides,

where *a*, *b*, and *c* are numbers whose values are functions of the valences and coordination numbers of M and M' with the total net positive charge on M times *a* being essentially equal to the total negative charge on (K) times *c*,

where *r* and *t* are numbers, *r* being greater than *t*.

where *d* is zero or a number, and

where *e* is zero or a number sufficient to increase the activity of $M_a(K)_c.H_2O$ for the polymerization of said monomer.

3,941,850

α,α,α',α'-TETRAKIS(4-HYDROXY-3,5-DISUBSTITUTED PHENYL)XYLENE

Gordon D. Brindell, Crystal Lake, and Joseph P. Wuskell, Barrington, both of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Division of Ser. No. 252,859, May 12, 1972, Pat. No. 3,836,590. This application Mar. 15, 1974, Ser. No. 451,456

Int. Cl.² C07C *39/12, 39/16*

U.S. Cl. 260—619 A **2 Claims**

1. α, α, α', α' -tetrakis (4-hydroxy-3,5-dibenzylphenyl) p-xylene.

3,941,851

1,4-BUTANEDIOL FROM HYDROGENATED HYDROFORMYLATED ALLYL ACETATE

William E. Smith, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 371,929, June 20, 1973, Pat. No. 3,880,913. This application Feb. 10, 1975, Ser. No. 548,216

Int. Cl.² C07C *29/00*

U.S. Cl. 260—635 R **6 Claims**

1. In the process for producing 1,4-butanediol by oxidatively coupling propylene with acetic acid to produce allyl acetate which is hydroformylated under hydroformylating conditions in the presence of a cobalt hydroformylating catalyst to produce a mixture comprising 4-acetoxybutyraldehyde, as the predominant product, and its two isomers, 2-acetoxybutyraldehyde and 3-acetoxy-2-methylpropionaldehyde and hydrogenating the mixture of aldehydes under hydrogenating conditions to produce a mixture comprising the acetate esters of 1,4-butanediol and its two isomers, 1,3-butanediol and 1,2-butanediol which are de-esterified under de-esterification conditions to their corresponding diols, the improvement wherein at least some of the 4-acetoxybutyraldehyde is separated from the mixture containing its two isomers to provide feedstock for the hydrogenation reaction and the mixture containing the isomers is dehydroformylated at a temperature in the range of 120°–250° C. in a nonoxidizing atmosphere and in the presence of a catalyst selected from the group consisting of a Group VIII noble metal and mixtures thereof or a Group VIII noble metal and mixtures thereof on an essentially neutral support to produce feedstock for the hydroformylation reaction.

3,941,852

SYNTHESIS OF 2-METHYL-3-BUTEN-2-OL

Pius Anton Wehrli, North Caldwell, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 151,557, June 9, 1971, Pat. No. 3,838,183. This application June 19, 1974, Ser. No. 480,661

Int. Cl.² C07C *29/26*

U.S. Cl. 260—643 R **4 Claims**

1. A process for separating 2-methyl-3-buten-2-ol from an aqueous medium which is an azeotrope of 2-methyl-3-buten-2-ol and water which comprises:

adding an alkali metal halide and an inert water-immiscible organic solvent to said aqueous medium to form a two-phase system containing an organic phase and an aqueous phase wherein the salt is added to provide at least 50% of the amount necessary to saturate said aqueous phase, separating said aqueous phase from said organic phase and fractionally distilling said organic phase to recover 2-methyl-3-buten-2-ol while maintaining the organic phase at a pH of at least 4.

3,941,853

SUBSTITUTED POLYNITRO-DIPHENYLMETHANES

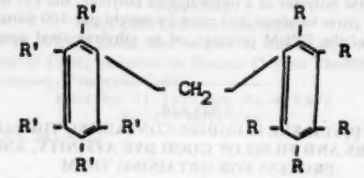
Kathryn G. Shipp, and Lloyd A. Kaplan, both of Silver Spring, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 644,434, May 29, 1967, Pat. No. 3,574,758. This application June 25, 1969, Ser. No. 871,220

Int. Cl.² C07C *79/10, 79/12*

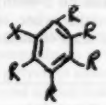
U.S. Cl. 260—645 **20 Claims**

1. The substituted ditan of the formula,

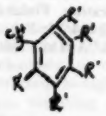


wherein each R and R′ is a radical selected from the group consisting of nitro, halo, hydrogen, lower alkyl, cyano, amino, phenyl, nitrophenyl, alkylphenyl, halonitrophenyl, styryl, nitrostyryl, halonitrostyryl, benzyl, nitrobenzyl, halonitrobenzyl and mixtures thereof providing that at least one R radical and at least three R′ radicals are nitro.

20. The process of preparing the ditan of claim 1 which comprises reacting, in an alkoxide solution, a nitro-substituted aromatic halide of the formula



wherein X is a halogen, selected from the group consisting of Cl, F, and Br with a nitro substituted alkyl benzene of the formula



wherein each R and R′ is a radical selected from the group consisting of nitro, halo, hydrogen, lower alkyl, cyano, amino, phenyl, nitrophenyl, alkylphenyl, halonitrophenyl, styryl, nitrostyryl, halonitrostyryl, benzyl, nitrobenzyl halonitrobenzyl and mixtures thereof; with the proviso that at least one R radical and at least three R′ radicals are nitro.

3,941,854

METHOD FOR PRODUCING STYRENE AND BENZENE

Raymond A. Franz, Baton Rouge, La.; Gary D. Madding, Evansville, Ind., and Tao P. Li, Chesterfield, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Apr. 25, 1974, Ser. No. 464,018

Int. Cl.² C07C *3/58, 5/42*

U.S. Cl. 260—669 R **10 Claims**

1. A process for the simultaneous dehydrogenation of ethylbenzene and the hydrodealkylation of toluene which comprises passing a mixture consisting essentially of toluene and ethylbenzene in mole proportions from about 1:1 to about 15:1 through a reaction zone maintained at a pressure up to about 100 psia and heated to a temperature from about 400° to about 900°C at a rate such that the reactants are exposed to said temperature for a period up to about 15 seconds, quenching the reaction effluent and recovering the styrene and benzene therefrom.

3,941,855

SHAPED POLYURETHANE ARTICLES AND A METHOD FOR MAKING THEM

Fritz Ehrhard, Neuss, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed July 22, 1974, Ser. No. 490,649

Claims priority, application Germany, July 27, 1973, 2338185

Int. Cl.² C08G *18/32*

U.S. Cl. 260—77.5 AP **7 Claims**

1. A method of manufacturing polyurethane products which are arc resistant, tracking resistant and resistant to open air conditions adapted for use as open air electrical insulators and electric switch plants which comprises reacting:

A. polyisocyanates in which at least some of the isocyanate groups are cycloaliphatically bound, said polyisocyanate consisting of an organic polyisocyanate or an organic polyisocyanate mixture in which at least 25% of the isocyanate groups present are cycloaliphatically bound isocyanate groups and which apart from said cycloaliphatically bound isocyanate groups contain only aliphatically bound isocyanate groups, with

B. a polyol mixture, the ratios of the reactants being selected to correspond to an NCO/OH ratio of between 0.8 and 1.2, the said polyol mixture being one having an average hydroxyl functionality of 2.2 to 3.0 and consisting essentially of

1. 5–30% by weight, based on the total polyol mixture, of a polyol with a molecular weight below 1,000 and which 50% to 100% of the hydroxyl groups are cycloaliphatically bound hydroxyl groups and which a part from said cycloaliphatic bound hydroxyl groups contain only aliphatically bound hydroxyl groups and,
2. 70–95% by weight of a polyol with a molecular weight below 1,000 which contains only aliphatically bound hydroxyl groups.

3,941,856

SURFACE TREATING COMPOSITIONS

Norman Geoffrey Creasey, and Leslie Clark Pike, both of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Jan. 29, 1974, Ser. No. 437,665

Claims priority, application United Kingdom, Jan. 30, 1973, 4584/73; July 5, 1973, 31984/73

Int. Cl.² C08L *83/04*

U.S. Cl. 260—825 **18 Claims**

1. A composition for use in surface treatment consisting essentially of 100 parts by weight of a diorganopolysiloxane having at least two hydroxyl groups attached to different silicon atoms per molecule and of viscosity not less than 3000 cs at 25°C, 1 to 20 parts by weight of an organohydrogenpolysiloxane of viscosity not greater than 1000 cs at 25°C and containing at least one silicon-bonded hydrogen atom for every three silicon atoms, 0.05 to less than 1 parts by weight of an aminoalkoxysilicon compound, 0.5 to 10 parts by weight of an alkoxy silicon compund of the formula:

$$R_g^{11}(R^{12}O)_f Sio$$

wherein R^{11} is a methyl group, R^{12} is selected from the group consisting of methyl, ethyl and methoxyethyl groups, g is 1.0 to 1.8, f is 0.3 to 1.0 and $g+f$ is not less than 2.0 and 1 to 20 parts by weight of a tin compound in an organic solvent.

3,941,857

POLYVINYLCHLORIDE/OLEFIN COPOLYMERS STABILIZED WITH EPOXY RESIN

Souheng Wu, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 341,333, March 15, 1973, abandoned. This application Nov. 1, 1974, Ser. No. 520,113

Int. Cl.² C08L 63/10

U.S. Cl. 260—837 PV 8 Claims

1. A composition comprising

A. 98–99.5% by weight, based on the weight of (A) plus (B), of a copolymer of film-forming molecular weight, prepared with and containing 0.01–0.5%, based on the weight of (A), of an epoxy reactive surfactant having at least one functional group selected from the group consisting of hydroxyl, carboxyl, amino, and sulfato, said copolymer comprising about 90 to 98% by weight vinyl chloride and about 2 to 10% by weight of ethylene or propylene; and

B. 0.5–2% by weight, based on the weight of (A) plus (B), of an epoxy resin having greater than 1 and no more than 3 equivalents of oxirane per molecule with an equivalent weight of between 150 and 6,000.

3,941,858

HYDROPHILIC POLYMERS, ARTICLES AND METHODS OF MAKING SAME

Thomas H. Shepherd, and Francis E. Gould, both of Princeton, N.J., assignors to National Patent Development Corporation, New York, N.Y.

Division of Ser. No. 654,044, July 5, 1967, abandoned, Continuation-in-part of Ser. No. 567,856, July 26, 1966, Pat. No. 3,520,949. This application Aug. 7, 1973, Ser. No. 386,430

Int. Cl.² C08K 3/24, 5/01; C08L 31/02

U.S. Cl. 260—885 10 Claims

1. A denture liner composition consisting essentially of an anhydrous mixture of a solid polymer prepared by rapid agitation of a water-soluble polymerizable hydroxyalkyl monoester of acrylic acid of methacrylic acid with a minor amount of a polymerizable diester of acrylic acid or methacrylic acid with an alcohol having at least two esterifiable hydroxyl groups in the presence of an amount of a free-radical, vinyl polymerization catalyst sufficient to polymerize the same while suspended in a form of small droplets in a non polar a suspending medium in which said polymer so formed in insoluble and a monomeric liquid consisting essentially of a major portion of a polymerizable water-soluble hydroxy-alkyl monoester of acrylic acid or methacrylic acid with a minor amount of a polymerizable diester of acrylic acid or methacrylic acid with an alcohol having at least two esterifiable hydroxyl groups in the presence of a free-radical, vinyl polymerization catalyst.

3,941,859

THERMOPLASTIC POLYMER BLENDS OF EPDM POLYMER, POLYETHYLENE AND ETHYLENE-VINYL ACETATE COPOLYMER

Martin Batiuk, Grafton; Richard M. Herman, Elyria, and James C. Healy, Avon, all of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Aug. 2, 1974, Ser. No. 494,029

Int. Cl.² C08L 23/16

U.S. Cl. 260—897 B 8 Claims

1. A thermoplastic polymer blend comprising (1) an EPDM polymer consisting essentially of interpolymerized units of about 65 percent to about 85 percent by weight of ethylene, about 5 percent to about 35 percent by weight of propylene, and about 0.2 percent to about 10 percent by weight of a diene monomer; said EPDM polymer having a weight percent unstretched crystallinity of from about 10 percent to about 20 percent by weight of the polymer and a melt endotherm value of about 6 to about 10 calories per gram, (2) from about 5 parts to about 400 parts by weight per 100 parts by weight of the EPDM polymer of a polyethylene polymer, and (3) from about 5 parts to about 300 parts by weight per 100 parts by weight of the EPDM polymer, of an ethylene-vinyl acetate copolymer.

3,941,860

POLYVINYLIDENE FLUORIDE CONTAINING THREADS, FIBERS AND FILMS OF GOOD DYE AFFINITY, AND PROCESS FOR OBTAINING THEM

Paul Couchoud, Dardilly, and Edouard Grimaud, Saint-Genis-Laval, both of France, assignors to Rhone-Poulenc-Textile, Paris, France

Filed June 3, 1974, Ser. No. 476,067

Claims priority, application France, June 6, 1973, 73.20667

Int. Cl.² C08L 27/16

U.S. Cl. 260—900 7 Claims

1. Threads, fibers and films of good dye affinity for plastosoluble and cationic dyestuffs, comprising

a mixture formed of a vinylidene fluoride homopolymer and a copolymer containing at least 60% by weight methyl methacrylate units and 5 to 40% by weight of units of a sulfonic acid ethylenic monomer selected from the group consisting of acrylamido-2-methyl-2-propane sulfonic acid and sulfoethyl methacrylate, or the alkaline salt, said mixture containing at least 40 acid milliequivalents per kg of polymer.

3,941,861

VAPORIZING APPARATUS FOR LIQUIDS

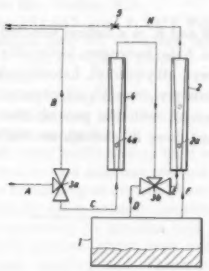
Veikko Hämäläinen, Vaahtorinne 3 C 38, 01600 Myyrmaki, and Jaakko Aarnio, Haarniskatie 6 B 13, 00910 Helsinki, both of Finland

Filed June 22, 1973, Ser. No. 372,623

Claims priority, application Finland, June 28, 1972, 1827/72; Sept. 11, 1972, 2494/72; Feb. 22, 1973, 545/73

Int. Cl.² A61M 17/00

U.S. Cl. 261—19 6 Claims



1. Apparatus for delivering controlled and metered amounts of vapors of volatile liquids to a point of utilization, said apparatus comprising:

a. a source of carrier gas, gas-flow metering means, and a reservoir for volatile liquid;

b. adjustable valve means connected to said flow metering means and to said reservoir for dividing a gas stream from said source of carrier gas into a first fraction flowing directly to said flow metering means and into a second fraction flowing to said reservoir;

c. separate gas conducting means connecting said valve with said flow metering means and with said reservoir;

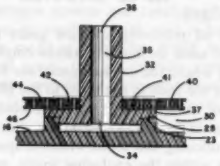
d. gas conducting means connecting said reservoir directly to said flow metering means; and

e. suction means connected to said flow metering means downstream thereof for inducing flow of gases and assisting evaporation of volatile liquid from said reservoir.

3,941,862
GAS DIFFUSING ASSEMBLY

John H. Price, LaJolla, and Miguel A. Ruksenas, Fallbrook, both of Calif., assignors to Hudson Oxygen Therapy Sales Company, Temecula, Calif.

Filed Dec. 11, 1973, Ser. No. 423,672
Int. Cl.² B01F 3/04
U.S. Cl. 261—122 11 Claims



1. In a humidifier for increasing humidification of an oxygen containing gas for inhalation therapy having a water holding receptacle and conduit means for directing the gas, a diffuser for said gas comprising:

a. a base plate having an outer peripheral edge;

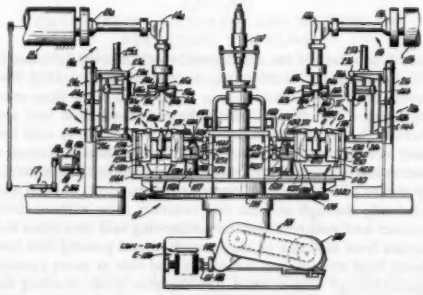
b. a diffuser sheet comprising a substantially gas impermeable membrane of polyvinyl chloride, a foamed polyvinyl chloride layer secured to one side of said membrane and a fabric backing secured on said foam layer opposite said membrane, and having a plurality of uniformly spaced perforations therethrough the outer periphery of which sheet is secured to said base plate adjacent its peripheral edge, said sheet and said plate cooperating to define a substantially open and undivided gas receiving chamber therebetween; and

c. a gas directing member having an upper end extending exteriorly from said gas receiving chamber and a lower end within said chamber and communicating therewith, whereby gas is directed through said gas directing member into said gas receiving chamber and outwardly through said perforations.

3,941,863
METHOD FOR MULTIPLE BLOW MOLDING WITH ROTARY TURNTABLE

Donald M. Pollock, Morristown, and Fulton W. Hallowell, Rumson, both of N.J., assignors to Consupak, Inc., Morristown, N.J.

Division of Ser. No. 368,249, June 8, 1973, Pat. No. 3,854,855. This application July 17, 1974, Ser. No. 489,239
Int. Cl.² B29C 17/07
U.S. Cl. 264—98 10 Claims



1. A method for multiple blow molding with a rotary table comprising;

a. forming at least two parisons, one parison each being formed at one of two circumferentially spaced stations, said stations being adjacent to a rotary indexing turntable;

b. gripping a portion of each of the parisons, severing the parisons from the means forming the parisons, and transporting the parison to the opened molds, and positioning each of said parisons at about the same time between respective open partible molds, said molds being mounted on and rotatable with said rotary table, said molds being circumferentially spaced one from the other equal to the circumferential spacing of said stations;

c. closing said molds at aobut the same time on said respective parisons;

d. introducing air to the interior of each of the parisons to expand the parisons to conform to the interior of the respective molds to form hollow objects;

e. rotating said table to simultaneously circumferentially transfer the molds from one station towards another station;

f. cooling said objects during said transfer;

g. opening the molds at about the same time; and

h. removing the objects therefrom at about the same time and prior to positioning other parisons at the respective circumferentially spaced stations.

3,941,864
METHOD FOR MANUFACTURING MOLDED STRUCTURES AND COATINGS BASED ON INORGANIC BINDING AGENTS

Erhard Bosch; Ewald Pirson, and Michael Roth, all of Burghausen, Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Filed May 28, 1974, Ser. No. 473,451
Claims priority, application Germany, June 4, 1973, 2328337
Int. Cl.² B28B 1/16
U.S. Cl. 264—256 10 Claims

1. A method for manufacturing molded structures and coatings from building materials based on inorganic binding agents and water which comprises coating the shape-imparting surface of a mold with a composition consisting essentially of a mixture of a curable organosilicon compound capable of imparting water repellency to the molded structures, a solvent and finely dispersed particles of an inorganic material having a surface area of from 10 to 400m²/g in an amount from 5 to 40% by weight based on the total weight of the mixture and applying to the uncured coating the building materials which are capable of curing to a solid, curing the materials and thereafter removing the molded structure.

3,941,865
EXTRUSION OF ETHYLENE OXIDE RESINS

Walter A. Miller, Somerville; Richard G. Shaw, Asbury, both of N.J., and Paul A. King, Warwick, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Dec. 10, 1973, Ser. No. 423,450
Int. Cl.² C08J 5/18; B29D 23/01
U.S. Cl. 264—95 8 Claims

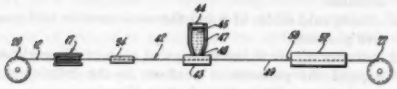
1. Method of extruding normally solid ethylene oxide resin which comprises extruding a composition comprising normally solid ethylene oxide resin containing about 4 to about 200 parts by weight of water per 100 parts by weight of ethylene oxide resin such that the melt flow of said composition lies in the range of about 0.05 to about 20 decigrams per minute when measured in accordance with ASTM D 1238-57 T modified in that measurements were made at 85°C. and 43.25 psi.

3,941,866

METHOD OF BONDING A THERMOPLASTIC RESINOUS PROTECTIVE COATING TO A METALLIC SUBSTRATE

Glen E. Ingraham, Lebanon, N.J., assignor to Colorguard Corporation, Raritan, N.J.

Filed July 31, 1973, Ser. No. 384,374
Int. Cl.² B29F *3/10*; B29C *25/00*
U.S. Cl. 264—135 15 Claims



1. A continuous process for applying a protective coating to a clean metallic substrate and simultaneously bonding said coating thereto that comprises applying, in a first treatment zone, to a rapidly advancing length of said substrate a first ply of molten hydropholic hot melt adhesive composition composed of a non-thermosetting phenolic-modified terpene resin and ethylene-vinyl acetate copolymer at a temperature of from about 200°F to 450°F to effect a bonding of said adhesive to said metallic substrate; advancing said adhesive coated substrate to a second treatment zone wherein said adhesive is cooled to a solid, soft, flow-resistant state and thereafter extruding onto said cooled adhesive in a third treatment zone, a molten extrudable thermoplastic resin composition selected from a plasticized vinyl resin, a polyolefin, and a polyamide at a temperature sufficient to melt said adhesive and effect a bond between said adhesive and said resin; and thereafter in a fourth treatment zone reducing the temperature of said advancing coated substrate to solidify the bonded coating of adhesive and thermoplastic resin composition.

3,941,867

PRODUCTION OF MOLYBDENUM TRIOXIDE FROM MOLYBDENITE IN A FLUIDIZED BED

Igor A. Wilkomirsky; Alan Paul Watkinson, and J. Keith Brimacombe, all of Vancouver, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Sept. 4, 1974, Ser. No. 502,929
Int. Cl.² C01G *39/00*
U.S. Cl. 423—53 13 Claims

1. A continuous fluidized bed process for producing molybdenum trioxide from molybdenum disulphide materials, comprising:

a. feeding to and fluidizing said materials in a composite fluidized bed, the feed materials having a fine particle size of the order of molybdenite ore flotation concentrates and not significantly above about 50 microns in diameter, the bed including fluidized refractory particles which are not readily elutriated from the bed, and the fluidizing gas including oxygen;

b. oxidizing the fluidized molybdenum disulphide particles at a temperature within the range of about 450° to about 650°C;

c. withdrawing oxidized particles from the bed and separating entrained oxidized particles from the off-gas stream;

d. circulating at least part of the discrete oxidized particles to again contact a fluidized bed as in (a) and (b), the weight ratio of recycle to feed being at least about 1:1, with the temperature during both (c) and (d) being maintained sufficiently high to prevent deposition of circulating solids and vapors; said latter temperature being above about 250°C; and

e. recovering molybdenum trioxide of low sulfur content from the oxidized particles.

3,941,868

METHOD OF REMOVING EXHAUST GASES FROM PLASTIC BINDED SAND MOLDS

Hans Riester, Schaffhausen, Switzerland, assignor to Georg Fischer Aktiengesellschaft, Switzerland

Filed Feb. 21, 1974, Ser. No. 444,693
Claims priority, application Switzerland, Feb. 24, 1973, 2635/73
Int. Cl.² B01D *47/00*
U.S. Cl. 423—210 4 Claims

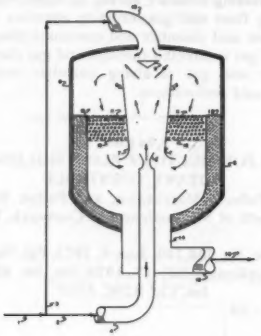
1. Method of removing exhaust gases produced from a plastic binder used in molding sands employed for forming casting molds where the exhaust gases are formed by the heat given off from the melt in the mold to the plastic-bonded sand during casting at a casting location, comprising the steps moving the mold from the casting location and during such movement enclosing the mold within a space, collecting the exhaust gases within the enclosing space, adding combustion air into the enclosing space for combination with the exhaust gases for forming an ignitable mixture, and igniting the mixture within the space for the combustion of the exhaust gases therein.

3,941,869

PROCESS FOR EXOTHERMIC REACTIONS

Warren Fuchs, 107 Cherry Lane, Laurel Hollow, Syosset, L. I., N.Y. 11791

Filed May 23, 1972, Ser. No. 256,117
Int. Cl.² B01J *8/00*; C01B *22/00*; C07C *29/16*; C01C *1/04*
U.S. Cl. 423—239 8 Claims



1. A process for the exothermic reaction of a fluid stream which comprises accelerating a cold unreacted feed fluid stream to a high velocity in a constricted fluid flow zone, aspirating a hot recycle fluid stream derived from said exothermic fluid stream reaction into the high velocity cold feed fluid stream, whereby a combined fluid stream is formed at intermediate temperature, passing said combined fluid stream by means of and inside of one or more conduits at least once internally through at least one reaction zone without direct contact with said reaction zone, removing said combined fluid stream from said one or more conduits and passing said combined fluid stream now outside of said one or more conduits again through said at least one reaction zone, reacting said combined fluid stream in said at least one reaction zone, whereby an exothermic reaction takes place in said reaction zone and a hot reacted fluid stream is discharged from said reaction zone, dividing said hot reacted fluid stream into a first

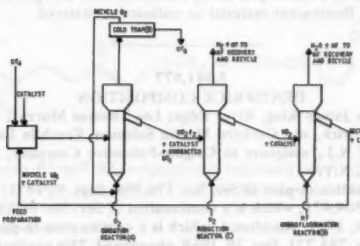
portion and a second portion, both of said portions being of identical composition, recycling the first portion of said hot reacted fluid stream as said hot recycle fluid stream, and withdrawing the second portion of said hot reacted fluid stream as a product reacted fluid stream.

3. The process of claim 2, in which said gas stream consists of a combined gas stream including the waste tail gas from a nitric acid production process, together with an added reducing gas, said waste tail gas containing residual nitrogen oxides, whereby said nitrogen oxides are catalytically reduced to elemental nitrogen by reaction with said reducing gas at a temperature in the range of 900°F to 1400°F in said catalytic reaction zone, said waste tail gas initially containing about 0.4% nitrogen oxides, and the recycle ratio of said first portion of hot reacted gas to said feed gas stream being about 0.38:1.0.

3,941,870
PROCESS FOR THE PRODUCTION OF URANIUM HEXAFLUORIDE

Alfred Ekstrom, Miranda, and Ashley Brooks McLaren, Padstow, both of Australia, assignors to Australian Atomic Energy Commission, Coogee, Australia

Filed Jan. 24, 1973, Ser. No. 326,537
Claims priority, application Australia, Feb. 2, 1972, 7830/72
Int. Cl.² C01G *43/06, 43/02;* B01J *23/40, 35/00*
U.S. Cl. 423—258 **33 Claims**



1. A method for the production of UF_6 comprising reacting UF_4 with air or oxygen at a temperature of 500° to 700°C in the presence of a catalyst selected from the group consisting of platinum, ruthenium, palladium, rhodium, osmium, iridium, gold, silver, nickel, copper oxide, cobalt oxide, platinum oxide and palladium oxide either unsupported or on a support selected from the group consisting of alumina, magnesia, silica, calcium fluoride and barium sulphate.

3,941,871
CRYSTALLINE SILICATES AND METHOD OF PREPARING THE SAME

Francis G. Dwyer, West Chester, Pa., and Edwin E. Jenkins, Woodstown, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 2, 1973, Ser. No. 412,393
Int. Cl.² C01B *33/20, 33/24, 33/28*
U.S. Cl. 423—326 **11 Claims**

1. A crystal metal organosilicate having a composition, in its anhydrous state, in terms of mole ratios of oxides as follows:

$$0.9 \pm 0.2\,[xR_2O + (1-x)M_{2/n}O] : < .005\,Al_2O_3 : > 1SiO_2$$

where M is sodium or sodium in combination with tin, calcium, nickel or zinc, R is a tetraalkylammonium and x is a number greater than 0 but not exceeding 1, said organosilicate having the X-ray diffraction lines set forth in Table I of the specification.

3,941,872
METHOD FOR PRODUCING CALCINED CLAY PIGMENTS

Victor Puskar, Basking Ridge, N.J., assignor to Engelhard Minerals & Chemicals Corporation, Edison, N.J.

Filed May 8, 1974, Ser. No. 468,189
Int. Cl.² C01B *33/24*
U.S. Cl. 423—331 **11 Claims**

1. A method for producing a calcined kaolin clay pigment which comprises heating finely divided particles of hydrated crystalline kaolin clay in a calciner under a reducing atmosphere to a temperature in the range of about 1400°F. to 2200°F., the time and temperature of heating being sufficient to dehydrate the particles of said clay withou sintering them, and thereafter heating the clay in a calciner in the presence of sufficient air to provide an oxidizing atmosphere to a temperature at least as high as the temperature to which said clay particles were heated under the reducing atmosphere and below the temperature at which sintering takes place, the temperature and time for heating in the oxidizing atmosphere being sufficient to result in a calcined clay pigment product that is brighter than the original hydrated clay and is also brighter than the calcined clay would be if all of the heating had been carried out under the oxidizing atmosphere at the temperature used when heating under the oxidizing atmosphere.

3,941,873
PROCESS FOR THE PREPARATION OF CARBONYL DIISOCYANATE

Hermann Hagemann, Cologne, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

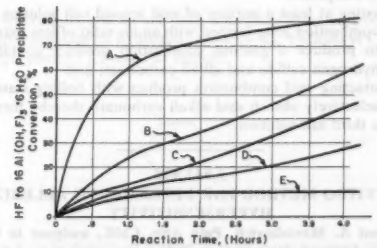
Filed Feb. 11, 1975, Ser. No. 548,954
Claims priority, application Germany, Mar. 12, 1974, 2411674
Int. Cl.² C01B *21/00*
U.S. Cl. 423—365 **4 Claims**

1. A process for the preparation of carbonyl diisocyanate comprising reacting trichloroisocyanuric acid and/or an alkali metal salt of dichloroisocyanuric acid with phosgene at a temperature of from about 150°C to about 200°C.

3,941,874
RECOVERY OF ALUMINUM FLUORIDE

Thomas F. Payne, Columbia Falls, Mont., assignor to Anaconda Aluminum Co., New York, N.Y.

Continuation-in-part of Ser. No. 335,494, Feb. 26, 1973, Pat. No. 3,843,498. This application July 30, 1974, Ser. No. 493,170
The portion of the term of this patent subsequent to Oct. 22, 1991, has been disclaimed.
Int. Cl.² C01F *7/50*
U.S. Cl. 423—489 **9 Claims**



1. Process for the recovery of aluminum fluoride from a dilute fluoride-containing aqueous solution the fluoride content of which consists essentially of hydrofluoric acid which comprises:

introducing commercial grade (Bayer process) aluminum oxide into said solution, said aluminum oxide comprising predominantly alpha alumina admixed with a minor amount of less highly calcined forms of alumina such that the aluminum oxide has a loss of weight on ignition of from about 0.5% to about 2.5%,

reacting the fluoride content of said solution with said less highly calcined forms of alumina for at least about 1 hour with stirring at an elevated temperature of between about 140° F. and the boiling point of the solution to produce a complex aluminum hydroxide fluoride hydrate ($16Al(OH,F)_3 \cdot 6H_2O$) that precipitates from said solution,

recovering said aluminum hydroxide fluoride hydrate precipitate from said solution, and

calcining said precipitate to produce aluminum fluoride, combined in a mixture with unreacted aluminum oxide.

3,941,875

PROCESS FOR TREATING GAS CONTAINING HYDROGEN SULFIDE

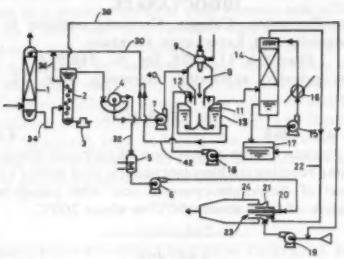
Hidemasa Tsuruta; Yukinori Hiwatashi; Teruhiko Hirabayashi, all of Tokyo, and Seiji Kumata, Fuchu, all of Japan, assignors to Nittetu Chemical Engineering Ltd., Tokyo, Japan

Filed Apr. 26, 1973, Ser. No. 354,868

Claims priority, application Japan, Apr. 26, 1972, 47-41259

Int. Cl.² C01B *17/06*; B01D *53/34*

U.S. Cl. 423—571 **4 Claims**



1. In a process for purifying gas containing hydrogen sulfide in which said gas is washed with an aqueous alkaline solution containing at least one alkali metal carbonate to absorb said hydrogen sulfide to form a first salt solution comprising hydrosulfides, said first salt solution being oxidized to form a second salt solution and to convert at least a portion of said hydrosulfides to free sulfur and at least one sulfur oxide salt selected from sulfates, sulfites and thiosulfates, said free sulfur being removed from said second salt solution; the improvement which comprises:

roasting at least a portion of said second salt solution in a combustion zone formed with an air ratio of less than 0.9 to produce a gaseous combustion product containing hydrogen sulfide and alkali carbonate; and

contacting said combustion product with boiling water to selectively absorb said alkali carbonate thereby forming a third salt solution.

3,941,876

IN VITRO METHOD FOR DETERMINING ALLERGIC HYPERSENSITIVITY

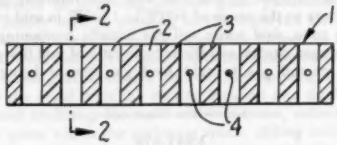
Vincent A. Marinkovich, Palo Alto, Calif., assignor to GTE New Ventures Corporation, Del.

Filed Apr. 25, 1973, Ser. No. 354,881

Int. Cl.² A61B *10/00*

U.S. Cl. 424—1 **5 Claims**

1. The method of determining hypersensitivity of human patients to allergens which comprises coating an elongated body of cellulose material with a cyanogen halide, coating a plurality of narrow bands of the cellulosic body with separate identified allergens said bands being separated from each other by narrow allergen-free bands, washing the cellulosic body with an amine to remove any unreacted cyanogen halide, contacting the washed cellulosic body with the blood serum of the patient, washing the cellulosic body with a dilute aqueous



solution of albumin to remove any blood serum not bonded to the cellulosic body, contacting the cellulosic body with an anti-immunoglobulin E serum labeled with a fluorscent material or with a radioactive material, washing the cellulose body with a dilute aqueous albumin solution to remove any unbonded anti-immunoglobulin E serum and then identifying those narrow bands previously contacted with allergen which contain fluorescent material or radioactive material.

3,941,877

DENTIFRICE COMPOSITION

William James King, River Edge; Leo Thomas Murray, East Brunswick, and Gerhard Martin Salzman, Franklin Lakes, all of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 176,396, Sept. 9, 1971, Pat. No. 3,864,471, which is a continuation of Ser. No. 848,241, Nov. 19, 1969, abandoned, which is a continuation-in-part of Ser. No. 785,731, Dec. 20, 1968, abandoned. This application May 20, 1974, Ser. No. 471,378

Int. Cl.² A61K *7/18*

U.S. Cl. 424—52 **6 Claims**

1. A dental cream composition comprising a water-soluble monofluorophosphate in amount which provides about 0.01–1% by weight fluorine to the dentifrice and about 20–75% by weight of a water-insoluble compatible polishing material consisting essentially of a mixture of calcium carbonate with insoluble alkali metal metaphosphate, the ratio of said calcium carbonate to said insoluble alkali metal metaphosphate being about 3:1 to about 1000:1;—said dentifrice having an initial pH of about 7 to 9.5.

3,941,878

MEDICAMENTS HAVING PSYCHOTROPIC PROPERTIES

M. Antoine Stenger; Henri Cousse, and M. Gilbert Mouzin, all of Castres, France, assignors to Pierre Fabre S.A., Castres, France

Continuation of Ser. No. 264,501, June 20, 1972. This application Nov. 21, 1974, Ser. No. 526,009

Claims priority, application France, June 21, 1971, 71.22575; June 5, 1972, 72.20391

Int. Cl.² A61K *31/165*, *31/615*

U.S. Cl. 424—233 **10 Claims**

7. A method for potentiating the effect of aspirin in a host which comprises administering to said host aspirin concurrently with an effective amount of a cresotamide compound selected from the group consisting of 5-bromo-ortho-cresotamide and N-C_1 to C_4-alkyl-5-bromo-ortho-cresotamide which is effective for the potentiation of said aspirin.

3,941,879

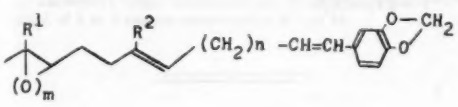
METHOD FOR INCREASING YIELD OF SILKWORM COCOONS EMPLOYING JUVENILE AND MOULTING HORMONES

Tetsuo Okauchi; Shoji Takamuku, both of Osaka; Saburo Tamura, Tokyo, and Seifun Chou, Kobe, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka and Nihon Tokushu Noyaku Seizo Kabushiki Kaisha, Tokyo, both of, Japan

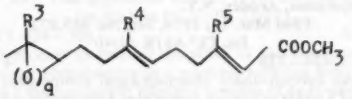
Filed Dec. 13, 1973, Ser. No. 424,316
Claims priority, application Japan, Dec. 28, 1972, 47-1656
Int. Cl.[2] A61K *31/56*
U.S. Cl. 424—240 3 Claims

1. A method for increasing the yield of silkworm cocoons which comprises administering to silkworm larvae, orally or through the body surface by means of spraying or dipping, an insect juvenile hormonal factor, which prevents silkworm larvae from metamorphosis, in an amount of from 0.01 to 100 μg.per silkworm larva in a period of from 24 to 96 hours after the start of feeding for their final instar, and administering to the silkworm larvae, orally or through the body surface by means of spraying or dipping, an insect moulting hormonal factor, which induces final-instar silkworm larvae to metamorphose into pupae, in an amount of from 0.1 to 50 μg.per silkworm larva in a period of from 110 to 288 hours after the start of feeding for the same instar, wherein

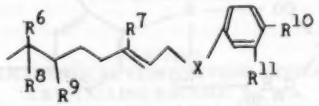
the insect juvenile hormonal factor is selected from the group consisting of a compound of the formula



wherein R^1 and R^2, respectively, represent alkyl of 1 to 4 carbon atoms, m is zero or 1 and n is zero, 1 or 2; a compound of the formula



wherein R^3, R^4 and R^5, respectively, represent alkyl of 1 to 4 carbon atoms and q is zero or 1; and a compound of the formula



wherein R^6 and R^7, respectively, represent alkyl of 1 to 4 carbon atoms, R^8 represents chlorine or alkoxy of 1 to 4 carbon atoms, R^9 represents hydrogen, or R^8 and R^9, taken together, represent oxygen, X represents oxygen or sulfur, R^{10} represents alkyl of 1 to 4 carbon atoms, nitro, halogen or alkoxycarbonyl of 1 to 5 carbon atoms, R^{11} represents hydrogen, or R^{10} and R^{11}, taken together, represent methylenedioxy, and

the insect moulting hormonal factor is selected from the group consisting of α-ecdysone, β-ecdysone, inokosterone, cyasterone, ponasterone A and ponasterone B.

3,941,880

METHOD FOR USE OF 11-LOWER ALKYL STEROIDS

George E. Short, Arlington Heights, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Division of Ser. No. 117,704, Feb. 22, 1971, Pat. No. 3,860,701, which is a continuation-in-part of Ser. Nos. 723,284, April 22, 1968, Pat. No. 3,565,991, and Ser. No. 28,934, April 15, 1970, Pat. No. 3,830,907. This application Sept. 16, 1974, Ser. No. 506,466
Int. Cl.[2] A61K *17/06*
U.S. Cl. 424—241 5 Claims

1. A method of controlling ovulation and estrus in female bovines which comprises the subcutaneous administration of an 11-lower alkyl steroidal progestational compound selected from the group comprising 17α-acetoxy-11β-methyl-19-norpregn-4-ene-3,20-dione and 3-(3-oxo-11β-methyl-17β hydroxyestr-4-en-17α-yl) propionic acid γ lactone, being essentially devoid of estrogenic activity, to said female bovines.

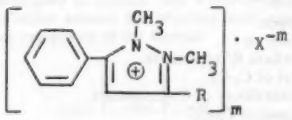
3,941,881

NOVEL 3 OR 5-AMINOPYRAZOLIUM SALTS AND FUNGICIDAL USE THEREOF

Barrington Cross, Rocky Hill, and Bryant Leonidas Walworth, Pennington, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Mar. 14, 1975, Ser. No. 558,610
Int. Cl.[2] A01N *9/22*
U.S. Cl. 424—250 6 Claims

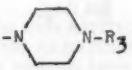
1. A method for the control of plant pathogenic fungi which comprises the step of: contacting said pathogenic fungi with a fungicidally effective amount of a compound having the formula:



where R is 4-pyridyl or a member represented by the formula:

$$-NR_1R_2$$

and wherein R_1 and R_2 are each a member selected from the group consisting of hydrogen, alkyl C_1–C_6, cycloalkyl C_5–C_6, benzyl, phenyl, 2,3-xylyl or radical:



where R_3 is hydrogen or methyl; X is an anion having a charge of from 1 to 3 and is selected from the group consisting of chloride, bromide, iodide, acetate, sulfate, hydrogen sulfate, methyl sulfate, benzene sulfonate, p-toluene sulfonate, nitrate, phosphate, carbonate and perchlorate, tetrafluoroborate; and *m* is an integer selected from 1 to 3.

3,941,882

RODENTICIDAL IMIDAZO-PYRIDINES

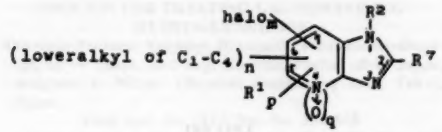
George O. P. O'Doherty, Greenfield, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 498,341, Aug. 19, 1974, abandoned, which is a continuation-in-part of Ser. No. 416,338, Nov. 15, 1973, abandoned. This application Oct. 23, 1974, Ser. No. 517,265

Int. Cl.[2] A01N 9/22, 17/14

U.S. Cl. 424—263 16 Claims

1. A method for reducing or eradicating a rodent population which comprises supplying to a locus frequented by said population an effective amount of an active agent which comprises at least one compound selected from the group consisting of those compounds of the formula



and the salts, with non-toxic cations, of those compounds wherein R^2 represents hydrogen or hydroxy; wherein R^1 represents

1. $-CF_3$,
2. $-CF_2Cl$, or
3. $-CF_2H$;

n represents an integer from 0 to 3; *q* represents 0 or 1; each of *n* and *p* represents 0 or 1, subject to the limitations (1) that where *n* is 1, the loweralkyl group so specified is at the 6-position; and (2) that the sum of *m*, *n*, and *p* is an integer from 1 to 3;

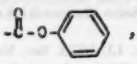
R^2 represents

1. hydrogen,
2. hydroxy, or
3. OR^3 where R^3 represents
   a. alkyl of C_1-C_8,
   b. (loweralkoxy of C_1-C_4)methyl,
   c. alkenyl of C_2-C_8,
   d. cycloalkyl of C_5-C_6,
   e. benzyl,
   f. phenethyl,
   g. alkanoyl of C_2-C_{18},
   h. alkenoyl of C_3-C_{18},
   i. carbamoyl of the formula

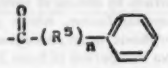
wherein one R^4 represents phenyl, loweralkyl of C_1-C_4, or loweralkenyl of C_2-C_4, and the other R^4 represents hydrogen, loweralkyl of C_1-C_4, or loweralkenyl of C_2-C_4, subject to the limitation that both R^4 moieties taken together do not contain more than six carbon atoms;

j. radical of the formula

loweralkyl of C_1-C_4 or



k. radical of the formula



wherein R^5 represents methylene, ethylene, or vinylene, and *n* represents 0 or 1,

l. $-SO_2-R^6$ wherein R^6 is loweralkyl as above defined, cycloalkyl of C_5-C_6, phenyl, benzyl, or phenyl bearing from 1–3 substituents, each of which is independently amino, nitro chloro, methyl, or methoxy;

and R^7 represents

1. perfluoroalkyl of C_1-C_7,
2. $-CF_2H$, or
3. $-CF_2-CF_2H$.

3,941,883

AROMATIC DICARBOXAMIDES AS ANTICONVULSANTS

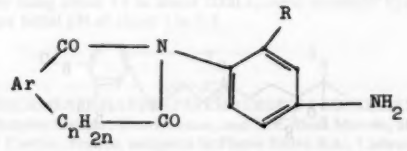
Heinz Werner Gschwend, New Providence, and Malvin J. Hillman, Bloomfield, both of N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 11, 1974, Ser. No. 449,872

Int. Cl.[2] A61K 31/40

U.S. Cl. 424—274 4 Claims

1. An anticonvulsant pharmaceutical composition in the form of a tablet or capsule comprising a spasmolytically effective amount of a compound corresponding to the formula



wherein Ar is 1,2-phenylene substituted by at least one member selected from lower alkyl, alkoxy, alkylmercapto, -sulfinyl or -sulfonyl, halogeno, trifluoromethyl, carbamoyl, sulfamoyl, mono- or dialkylcarbamoyl or -sulfamoyl; unsubstituted or alkylated and/or halogenated 2,3- or 3,4-(furylene, thienylene or pyridylene), R is lower alkyl, (hydroxy, alkoxy, alkylmercapto, -sulfinyl or -sulfonyl)-alkyl, halogeno or trifluoromethyl, *n* is 0 and C_nH_{2n} separates Ar from CO by one or no carbon atom, or acid addition salts thereof, together with a pharmaceutical excipient.

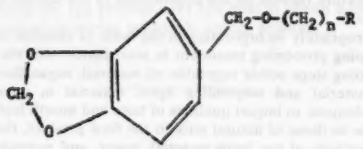
3,941,884

PIPERONYL ETHERS HAVING JUVENILE HORMONE MIMETIC ACTIVITY

Laroy H. Edwards, Napa, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 226,963, Feb. 16, 1972, Pat. No. 3,796,726. This application Jan. 10, 1974, Ser. No. 432,365
Int. Cl.² A01N 9/28
U.S. Cl. 424—282 19 Claims

1. A method for killing insects selected from the group consisting of Tenebrio molitor, Trichoplusia ni and Rhodnius Prolixus which comprises contacting the insects with a metamorphosis-inhibiting amount of a compound of the formula



where R is hydroxy, halogen of atomic number 9 to 35, vinyl, alkoxy of 1 to 4 carbon atoms, alkylthio of 1 to 4 carbon atoms, epoxy, acyclic carboxylic acyl of 1 to 5 carbon atoms or carbamoyl singly substituted on the nitrogen atom with alkyl of 1 to 4 carbon atoms and n is 1 to 14.

3,941,885

COMPOSITIONS USEFUL FOR TREATING PARKINSONISM

Elijah H. Gold, West Orange, N.J., assignor to Schering Corporation, Kenilworth, N.J.

Division of Ser. No. 408,021, Oct. 19, 1973, Pat. No. 3,891,697. This application Mar. 3, 1975, Ser. No. 554,807
Int. Cl.² A61K 31/19, 31/215
U.S. Cl. 424—305 5 Claims

1. A process for treating symptoms of parkinsonism, which comprised administering to a mammal suffering from parkinsonism a therapeutically effective quantity of an N-adamantylmethylamino derivative selected from the group consisting of 3-[N-(1-adamantylamino)]propionic acid and a lower n-alkyl ester of 4-[N-(1-adamantyl)-N-methylamino]butyric acid and a pharmaceutically acceptable salt thereof.

3,941,886

PHARMACEUTICAL COMPOSITIONS CONTAINING CRYSTALLINE RACEMIC 9α, 11α, 15(S)-TRIHYDROXY-5-CIS, 13-TRANS-PROSTADIENOIC ACID

Ned M. Weinshenker, Palo Alto, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Division of Ser. No. 399,591, Sept. 21, 1973, which is a continuation-in-part of Ser. No. 146,491, May 24, 1971, abandoned. This application Apr. 17, 1975, Ser. No. 569,078
Int. Cl.² A61K 31/19
U.S. Cl. 424—317 1 Claim

1. A pharmaceutical composition comprising from 0.01 micrograms to 250 milligrams of crystalline, racemate 9α,11α,-15(S)-trihydroxy-5-cis,13-trans-prostadienoic acid wherein the crystals are characterized by the following X-ray diffraction data:

Interplanar Spacings, A	
27.60	4.65
18.19	4.09
13.00	3.54
10.33	3.30
8.38	2.98
7.31	2.79
6.06	2.63
5.40	2.53
4.92	2.04
4.67	

and wherein the crystals system is monoclinic, the crystal habit is tubular, the optic sign is negative, and the melting point is 63.5°C to 64°C, mixed with a pharmaceutical carrier.

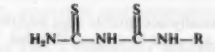
3,941,887

DITHIOBIURET DERIVATIVES USED FOR REPELLING BIRDS, RODENTS, LEPORINE ANIMALS AND RUMINANTS

Günther Hermann, Leverkusen, Germany; Peter Hoffmann, Hollywood, Calif.; Friedrich-Karl Rosendahl, Leverkusen, Germany, and Ivar Ugi, Santa Monica, Calif., assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 825,447, May 16, 1969, abandoned. This application Nov. 28, 1973, Ser. No. 419,854
Claims priority, application Germany, May 20, 1968, 1767535
Int. Cl.² A01N 9/12, 9/20
U.S. Cl. 424—322 3 Claims

1. A method for repelling warm-blooded creatures selected from the group consisting of birds, rodents, leporine animals and ruminants, which comprises fumigating structures from which it is desired to exclude said warm-blooded creatures with an effective amount for repelling such creatures of a dithiobiuret compound of the formula



in which R is selected from the group consisting of alkyl of 1–6 carbon atoms, cycloalkyl of 5–6 carbon atoms, phenyl, alkyl-substituted phenyl having 1–4 carbon atoms in each corresponding alkyl moiety, and alkyl-chloro-phenyl having 1–4 carbon atoms in the alkyl moiety.

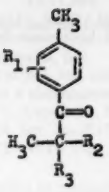
3,941,888

SUBSTITUTED OR UNSUBSTITUTED P-ALKANOYL TOLUENES AS HYPOLIPIDEMICS

William J. Houlihan, Mountain Lakes, and Jeffrey Nadelson, Lake Parsippany, both of N.J., assignors to Sandoz, Inc., E. Hanover, N.J.

Continuation-in-part of Ser. No. 495,862, Aug. 8, 1974, abandoned. This application Feb. 3, 1975, Ser. No. 546,755
Int. Cl.² A61K 31/12
U.S. Cl. 424—331 7 Claims

1. A method for treating lipidemia which comprises administering to a mammal in need of said treatment a hypolipidemic effective amount of a compound of the formula:



where

R_1 represents hydrogen, halo having an atomic weight of about 19 to 36, or straight chain lower alkoxy having 1 to 4 carbon atoms, and

R_2 and R_3 each independently represent alkyl having 1 to 2 carbon atoms.

3,941,889

5-(SUBSTITUTED PHENOXY)-4-AMINO PYRIMIDINES AS ANTI-ULCER AGENTS

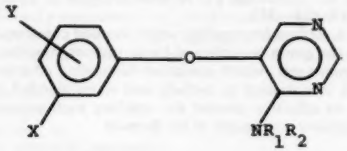
Christopher Andrew Lipinski, Waterford, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 287,423, Sept. 8, 1972, Pat. No. 3,862,190. This application Nov. 4, 1974, Ser. No. 520,486

Int. Cl.² A61K *31/505*

U.S. Cl. 424—251 **1 Claim**

1. A method for the control of ulcers in an animal which comprises administering orally or intraperitoneally to an animal in need of such control a composition containing a diluent amount of a pharmaceutically-acceptable carrier and an amount effective to control said ulcers of a compound selected from the group consisting of



and a pharmaceutically-acceptable acid addition salt thereof, wherein X and Y are each hydrogen, chlorine, bromine, fluorine, alkyl containing from 1 to 6 carbon atoms, trifluoromethyl or alkoxy containing from 1 to 3 carbon atoms in the alkyl moiety; R_1 and R_2 are each hydrogen to alkyl containing from 1 to 6 carbon atoms.

3,941,890

METHOD OF MAKING SOY MILK

Frederick G. Drachenberg, 11674 Valverde, Riverside, Calif. 92505, and Paul E. Allred, Box 373, Loma Linda, Calif. 92354

Filed Oct. 23, 1974, Ser. No. 517,057

Int. Cl.² A23L *1/20, 2/38;* **A23C** *11/00*

U.S. Cl. 426—46 **9 Claims**

1. A method of making soy milk comprising the steps of:

cooking soy bean material with microwaves for a sufficient length of time to substantially destroy the trypsin inhibitor known to be present therein without causing any appreciable roasting of said material;

dispersing the microwave-cooked material in relatively finely divided form in a sufficient quantity of warm water at a temperature less than 70°C to form a slurry and incorporating in the slurry, in any suitable manner, a sufficient quantity of suitable enzymic material, its equivalent or a mixture thereof to act upon any proteinaceous, carbohydrate and cellulosic constituents of the microwave-cooked material which would otherwise form a sediment in the final soy milk product in such fashion as to substantially prevent those constituents from forming said sediment;

providing sufficient time to permit said enzymic material, its equivalent or a mixture thereof to act upon said proteinaceous, carbohydrate and cellulosic constituents to convert them to such form as to obviate ultimate sedimentation thereof in said final soy milk product without causing any substantially deleterious effect on other constituents of the microwave-cooked material;

treating said slurry to substantially reduce the size range of its particles to colloidal size range;

diluting the treated slurry with hot water and subjecting the diluted mixture to boiling action to put an end to any further action of the enzymic material, its equivalent, or mixture thereof on the constituents of the diluted slurry; and

appropriately incorporating in the body of material undergoing processing treatment in accordance with the foregoing steps edible vegetable oil material, sugar, flavoring material and suspending agent material in quantities adequate to impart qualities of taste and mouth feel similar to those of natural milk to the final product, the proportions of soy bean material, water, and vegetable oil material employed being such as to insure a product having substantially the consistency of natural milk in its homogenized, or other commercially altered, form.

3,941,891

SYNERGISTIC COMBINATION CHEESE EXTENDER

Robert L. Kasik, Berwyn, and Marvin A. Peterson, Park Ridge, both of Ill., assignors to Beatrice Foods Co., Chicago, Ill.

Continuation-in-part of Ser. No. 455,510, March 27, 1974. This application Apr. 28, 1975, Ser. No. 572,189

Int. Cl.² A23J *3/02*

U.S. Cl. 426—94 **33 Claims**

1. A cheese extender composition comprising a congealed mixture of:

a synergistic combination of sodium caseinate and potassium caseinate;

a fat having a melting point of 130°F. or less;

and water;

the weight ratio of the synergistic combination to fat being from 1:2 to 2:1, the weight ratio of water to the total of the synergistic combination and fat being from 1:2 to 3:1, and the ratio of sodium caseinate to potassium caseinate in the synergistic combination being from 4:1 to 1:4, whereby the composition exhibits the stringy characteristic, texture and mouth-feel similar to that of natural mozzarella cheese.

3,941,892

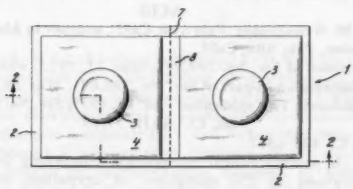
LOW-CHOLESTEROL EGG PRODUCT AND PROCESS

George Marvin Glasser, Ossining, and Herbert Matos, New York, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed July 1, 1974, Ser. No. 484,382

Int. Cl.² A23L *1/32*

U.S. Cl. 426—104 **10 Claims**



9. A method for preparing a low cholesterol egg product resembling a sunnyside up egg product comprising:

a. providing a mold having yolk cavity and a white cavity;
b. supplying to the yolk cavity, a simulated yolk portion having a water to dry ingredient ratio of from about 0.8 to about 1.2, and comprising, based on the weight of dry ingredients, from about 20% to about 45% of dry egg white, from about 5% to about 35% of an oil having a P/S of greater than about 0.6, from about 10% to about 15% of a dry milk protein source, from about 0.5% to about 7% of vegetable gum, and flavoring, coloring and emulsifiers in an amount sufficient to maintain uniformity in the yolk portion;
c. supplying to the white cavity on top of the yolk portion, a white portion consisting essentially of liquid egg white;
d. freezing the yolk and white portions;
e. removing the frozen egg product from the mold; and
f. frying the egg product over low heat to obtain a cooked, natural appearing sunnyside up egg product.

3,941,893

AGGLOMERATION PROCESS

Elmer F. Glabe, Northbrook; Perry W. Anderson, Niles; Stergios Laftsidis, and Philip G. Grothus, both of Chicago, all of Ill., assignors to Food Technology, Inc., Chicago, Ill.

Filed Oct. 17, 1974, Ser. No. 515,579
Int. Cl.² A23L *1/08, 1/09*
U.S. Cl. 426—285 10 Claims

1. A process for forming agglomerates of dehydrated sugary syrups obtained initially in the form of dried or ground flakes obtained by thin film drying of said syrups in the presence of a substance selected from the group consisting of ungelatinized starch which is partially gelatinized in situ during the dehydration and soy protein, said sugary syrups being selected from the group consisting of corn syrup, malt syrup, sorghum syrup, molasses, honey, high fructose corn syrup, sugary syrups containing invert sugar, and mixtures thereof, the said syrups being intimately mixed with one or more of said substances to form a slurry and subsequently said slurry being subjected in a thin film to a heated surface for a period of time sufficient to dehydrate said slurry to form a thin dehydrated film and the dried flakes or ground flakes being formed from said dehydrated film, which comprises spraying said dried or ground flakes with 10% to 27% by weight, based on the weight of said flakes, while tumbling them to form agglomerates, drying the resultant moistened tumbled agglomerates by blowing air on them while continuing the tumbling until stickiness of the agglomerates is reduced, and thereafter drying the resultant agglomerates in a static condition at temperatures within the range of 75°–180°F. until the moisture content is reduced to approximately 1.5–7% by weight.

3,941,894

COMPOSITION FOR REDUCING PICKLE BLOATING

Richard C. Hall, Cleveland; Norman D. Kidd, Middleburg Heights, and George V. Daravingas, Lakewood, all of Ohio, assignors to SCM Corporation, New York, N.Y.

Division of Ser. No. 294,722, Oct. 3, 1972, Pat. No. 3,849,579.
This application July 3, 1974, Ser. No. 485,552
Int. Cl.² A23B *7/10*
U.S. Cl. 426—532 3 Claims

1. In combination with cucumbers, a brine curing composition for curing said cucumber by natural bacteriological fermentation, the improvement which comprises said brine curing composition having between about 0.005% to 0.5% by volume of dehydroacetic acid in the brine solution based on the total volume of brine solution and cucumbers.

3,941,895

REPLACEMENT OF NONFAT DRY MILK

David J. Ash, Norwalk, and John C. Colmey, Stamford, both of Conn., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Nov. 29, 1973, Ser. No. 420,036
Int. Cl.² A21D *13/00*
U.S. Cl. 426—549 4 Claims

1. A method of preparing a food composition normally containing nonfat dry milk selected from the group consisting of cakes, biscuits, muffins, pancakes, donuts, and breads comprising replacing substantially all the nonfat dry milk requirement of said food composition with partially demineralized and partially delactosed whey solids in an amount to form 0.4 to 3.0 percent by weight of the composition and wherein said whey solids has an ash to protein ratio of 0.01 to 0.3.

3,941,896

NOVEL NITROGEN AND PHOSPHORUS-CONTAINING SALTS

Raymond Anthony Smith, Walsall, and Ralph Thomas Russell, Brierley Hill, both of England, assignors to Albright & Wilson Limited, Oldbury near Birmingham, England

Continuation of Ser. No. 853,215, Aug. 26, 1969, abandoned.
This application Nov. 8, 1973, Ser. No. 413,972
Claims priority, application United Kingdom, Sept. 4, 1968, 42066/68
Int. Cl.² C01B *15/16, 25/26*
U.S. Cl. 423—306 27 Claims

1. Modified ammonium polyphosphates having the formula $H_h\ (NH_4)_n\ O\ (PO_3)_p\ (PO_2NH)_q\ (BO_2)_b\ (X)_x\ (H_2O)_y$, wherein X is at least one divalent group selected from $+SO_3+$, $+SO_2+$ and $+HPO_2+$, and h, n, p, q, b, x and y are all numbers from 0 to 20 which also comply with the following criteria:

$p>2$; $p>q$; $(h+n)=(p+q+b+2)$; $(p+q)/(b+x)$ is from 1 to 100; and $n>o$; and $n>h$ which are water-soluble and contain at least one radical selected from the group consisting of borate, sulphate, sulphite, and phosphite produced by admixing

component (i) an organic ammoniating and condensing agent,

component (ii) a phosphoric acid, the molar proportion of said component (i) to said component (ii) based on the P_2O_5 content in said component (ii), being from 1.3:1 to 3:1, and

component (iii) a compound selected from sulphuric acid, boric acid, boric oxide, phosphorous acid, sulphurous acid and the sodium potassium, calcium, urea and ammonium salts of said compound, the proportion of said component (iii) being from 2 to 1/10 moles per mole of P_2O_5 in the admixture; and heating until a self-sustaining exothermic reaction occurs whereby said three components react and form said water-soluble modified ammonium polyphosphates.

3,941,897

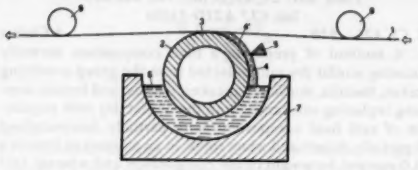
PROCESS FOR CONTINUOUS PARAFFINING OF YARNS

Gino Dalla Vecchia, Santorso, Italy, assignor to Rimar S.p.A., Trissino, Italy

Division of Ser. No. 349,712, April 10, 1973, abandoned. This application Mar. 25, 1975, Ser. No. 561,777
Claims priority, application Italy, Apr. 17, 1972, 23214/72
Int. Cl.² B05G *1/06*
U.S. Cl. 427—11 5 Claims

1. A process for the continuous paraffining of yarns which comprises maintaining a bath for molten paraffin, rotating a cylinder mounted on a horizontal axis in a position above the bath to cause a bottom portion of the circumference of the cylinder to be submerged into said bath so that a molten layer of paraffin is deposited on the cylinders' circumference, cooling the circumference of the cylinder sufficient to solidify the molten paraffin layer before said portion of the circumference

reaches the top of its rotational path, drawing the yarns under tension over a short arc of the top of the cylinder and in frictional contact with the solidified paraffin layer on the



rotating cylinder whereby the yarns are rubbed with a coating of paraffin and the paraffin removed from the cylinder by said rubbing is replaced as the cylinder rotates back through the molten bath.

3,941,898

DEVELOPING METHOD UTILIZING PULVERIZED, COLORED, CROSSLINKED, VINYLIC POLYMER RESIN AS TONER

Shigeru Sadamatsu, and Toll Nozaki, both of Minami-ashigara, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jan. 4, 1974, Ser. No. 430,615

Claims priority, application Japan, Jan. 16, 1973, 48-006612

Int. Cl.[2] B05D *1/06*; G03G *9/08*

U.S. Cl. 427—18 13 Claims

1. A method for developing a latent electrostatic image bearing member comprising forming a latent electrostatic image on said member and applying a developer thereto, said developer including at least a toner where said toner is affected by said latent image to effect development thereof, said toner comprising a pulverized, colored, crosslinked, vinylic polymer resin obtained by (a) polymerizing the monomer thereof in the presence of a crosslinking agent 0.005 – 20% by weight of the monomer, said crosslinking agent being selected from the group consisting of aromatic divinyl compounds, diethylenecarboxylate esters, divinyl sulfide, divinyl solfone, and mixtures thereof and a molecular weight control agent 0 – 20% by weight of the monomer, said monomer being non-soluble in said molecular weight control agent, (b) mixing at least one coloring material with the thus obtained resin and (c) pulverizing the obtained mixture.

3,941,899

METHOD OF COATING ELECTRODES

Tibor Kugler, Thayngen, and Hans Wolfhart Rieger, Beringen, both of Switzerland, assignors to Swiss Aluminium Ltd., Switzerland

Filed Nov. 15, 1972, Ser. No. 306,632

Claims priority, application Switzerland, Nov. 16, 1971, 16605/71

Int. Cl.[2] B05D *5/12*, *1/00*

U.S. Cl. 427—34 5 Claims

1. A method of applying to a carbon anode for use in fusion electrolysis a coating for protection of the anode against surrounding influences, comprising delivering aluminium oxide and aluminium in finely dispersed form onto the anode with an oxidizing ionised gas jet having sufficient heat content and impact energy to cause adhesion between the coating and the simultaneously heated surface of the anode and consolidation of the coating, wherein the coating consists of a cermet-type layer of aluminium oxide and aluminium with a thickness of 0.1 to 1.0mm., and wherein the cermet-type layer is formed of aluminium oxide and aluminium in a ratio by weight of 10:1 to 2:1.

3,941,900

METHOD FOR PRODUCING HIGHLY PURE SILICON

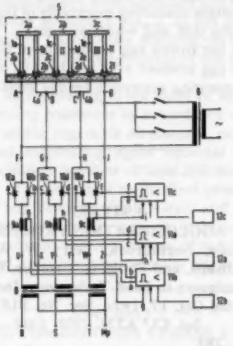
Hans Stut, Grobenzell, and Gerhard Barowski, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Feb. 20, 1974, Ser. No. 443,950

Claims priority, application Germany, Mar. 28, 1973, 2315469

Int. Cl.[2] B05D *5/12*

U.S. Cl. 427—86 6 Claims



1. A method for the production of highly pure silicon by depositing silicon from a corresponding reaction gas on the outer surface of silicon rod-shaped carrier members which are heated in the reaction gas to the depositing temperature, comprising the steps of simultaneously preheating the members to a predetermined temperature by connecting separate groups of carrier members to separate phases of an *n*-phase electrical supply, where *n* is an integer larger than two; and heating the carrier members to the depositing temperature by connecting the carrier members, contemporaneously with their group phase connections, in series and connecting the series to a heating current source.

3,941,901

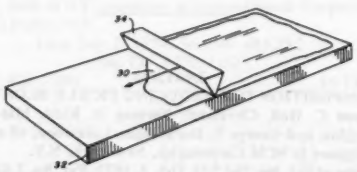
SURFACE ALIGNMENT METHOD FOR LIQUID CRYSTAL CELLS AND PRODUCTION OF POLARIZERS THEREFOR

Thomas B. Harsch, Stow, Ohio, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Feb. 15, 1974, Ser. No. 442,930

Int. Cl.[2] G02F *1/13*

U.S. Cl. 427—108 10 Claims



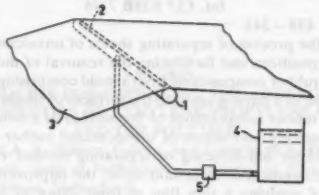
1. A method for aligning a long chain vinyl polymeric surface for subsequent homogeneous orientation of liquid crystal molecules, which comprises dissolving the long chain polymer in a solvent, applying the solution of the polymer and solvent to a substrate, subjecting the thus-applied polymer to shear forces to effect shear thinning and alignment of the long chain polymer molecules, and evaporating said solvent from the long chain polymer, leaving the long chain molecules aligned.

3,941,902

METHOD OF MAKING SURFACE-TREATED PAPER

Bengt Axel Wennerblom, Pitea, and Gustav Robert Svensson, Sundsvall, both of Sweden, assignors to Svenska Cellulosa Aktiebolaget, Sundsvall, Sweden

Filed Feb. 21, 1974, Ser. No. 444,492
Claims priority, application Sweden, Mar. 2, 1973, 7302960
Int. Cl.² B05C 3/02; B05D 3/02
U.S. Cl. 427—172 3 Claims



1. Method of surface sizing paper in the form of a continuous web, which consists essentially of passing the web over and in direct contact with a slot-shaped aperture in a container, which aperture is co-extensive with the width of the web, while continuously introducing into the container and exiting the same via the slot thereof a sizing material consisting essentially in an aqueous suspension of a sizing agent, continuously transferring the so-exiting sizing material without pulsations and without any excess, to the web passing said web over the surfaces adjacent the aperture at an angle of from 0° to 45° while under a controlled tension of at least 50 newton, said sizing material being introduced into said container at such a rate that the sizing material is applied to the paper web in an amount of at least $(1.4 + 0.0107.B)$cm³ per m² of the paper web, where B = the surface roughness of the web measured according to Bendsten, and drying and reeling the so-sized paper web dried and finally reeled.

3,941,903

WEAR-RESISTANT BEARING MATERIAL AND A PROCESS FOR MAKING IT

Robert C. Tucker, Jr., Indianapolis, Ind., assignor to Union Carbide Corporation, New York, N.Y.

Filed Nov. 17, 1972, Ser. No. 307,344
Int. Cl.² B05D 3/02
U.S. Cl. 427—190 4 Claims

1. A process for producing a wear-resistant bearing material on a solid structural substrate comprising:

a. preparing a binary mixture consisting of hard phase particles selected from the groups consisting of metal oxides, metal carbides, metal borides, metal nitrides and metal silicides with powders of a metal selected from the group consisting of elemental metal and metal alloys, said hard phase particles being sized between about 0.05 micron and about 100 microns, and present in a volume fraction of between about 3% and about 25%; and said metal powders being sized 200 Tyler mesh and finer; and

b. depositing said mixture of hard phase particles and metal powders onto a substrate by a technique selected from the group consisting of plasma spraying, flame spraying and detonation gun means, so as to produce a bearing material having a Diamond Pyramid hardness value not exceeding about 500 as tested under a load of 300 grams.

3,941,904

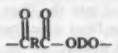
METHOD OF APPLYING ADHESIVE COATINGS USING SEGMENTED COPOLYESTER COMPOSITIONS

George Lok Kwong Hoh, and Akira Tsukamoto, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours & Company, Wilmington, Del.

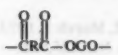
Division of Ser. No. 279,370, Aug. 10, 1972, Pat. No. 3,832,314, which is a continuation-in-part of Ser. No. 151,477, June 9, 1971, abandoned, which is a continuation-in-part of Ser. No. 100,291, Dec. 21, 1970, abandoned. This application June 13, 1974, Ser. No. 478,970
Int. Cl.² C09J 7/02
U.S. Cl. 427—207 2 Claims

1. A method of applying a coating of a hot-melt adhesive to a substrate which comprises applying as the adhesive coating a composition which comprises, based on the total thermoplastic components,

A. 1 to 99 percent by weight of thermoplastic segmented copolyester elastomer consisting essentially of a multiplicity of recurring short chain ester units and long chain ester units joined through ester linkages, said short chain ester units amounting to 15 to 75 percent by weight of said copolyester and being of the formula



and said long chain ester units amounting to 25 to 85 percent by weight of said copolyester and being of the formula



wherein R is the divalent aromatic radical remaining after removal of the carboxyl group from aromatic dicarboxylic acid having a molecular weight of less than 350, D is the divalent radical remaining after removal of the hydroxyl groups from organic diol having a molecular weight of less than 250, and G is the divalent radical remaining after removal of the terminal hydroxyl groups from long chain glycol having an average molecular weight of 350 to 6000, said copolyester having a melt index of less than 150 and a melting point of at least 125°C., and

B. 1 to 99 percent by weight of low molecular weight thermoplastic resin which forms compatible mixtures with the segmented copolyester, is thermally stable at 150°C., and has a melt viscosity of less than 10,000 centipoises at 200°C.

3,941,905

METHOD OF CONTINUOUSLY IMPREGNATING A TEXTILE FIBER ARRANGEMENT WITH LIQUIDS

Werner Naegeli, Winterthur, Switzerland, assignor to Pavena AG, Basel, Switzerland

Continuation of Ser. No. 187,965, Oct. 12, 1971, abandoned. This application Apr. 2, 1973, Ser. No. 347,350
Int. Cl.² B05C 1/08
U.S. Cl. 427—240 9 Claims

1. A method of continuously introducing an impregnating liquid into an untwisted textile fiber arrangement, comprising the steps of:

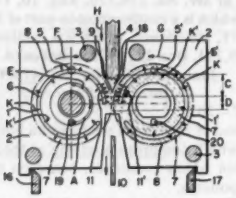
a. passing the fiber arrangement through a converging space formed by circumferential surfaces of a pair of discs and by lateral limiting walls for consolidating the fiber arrangement into a fiber sliver;

b. supplying impregnating liquid under pressure through the lateral limiting walls into the clearance between the face sides of the discs and the lateral limiting walls;

c. aligning the planes of the discs and the lateral limiting walls with respect to each other by forming a liquid film

between the face sides of the discs and the lateral limiting walls;

d. transporting the liquid along the face sides of said discs to said circumferential surfaces into said converging space by rotating the discs;



e. forming a coat of liquid surrounding the fiber arrangement passing through and consolidated in said converging space; and

f. subsequently condensing the fiber sliver into a compact fiber sliver in an adjacent hydrodynamic pressure zone acting at all sides and pressing liquid into the fiber sliver in said pressure zone by passing the fiber sliver between the circumferential surfaces of said discs.

3,941,906

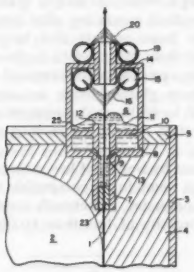
HOT DIP METALLIZING PROCESS

Theodore Bostroem, 460 Park Road Extension, Middlebury, Conn. 06762

Continuation-in-part of Ser. No. 337,172, March 1, 1973. This application Dec. 17, 1973, Ser. No. 425,081

Int. Cl.² C23C 1/00

U.S. Cl. 427—360 **8 Claims**



1. A process of hot dip metallizing ferrous articles by passing the article to be metallized through a bath of molten lead and conducting the article from said molten lead bath through a confined layer of the molten coating metal, the surface area of said confined coating metal layer being a small fraction of the surface area of the lead bath, said confined layer floating on said lead and being of predetermined and limited height, thereby limiting the time of contact between the ferrous article to be coated and the coating metal to a predetermined limited time to achieve a coating of a predetermined character and avoiding any attack of the equipment by the coating metal, the improvement which consists in supplying the molten coating metal to said confined layer of coating metal in quantities substantially exceeding the quantity required for metallizing the ferrous article in such a manner that droplets of molten lead adhering to the ferrous article on passing into the confined layer of molten coating metal are substantially completely removed from the surface of the ferrous article to be hot dip metallized, thereby causing continuous overflow of molten coating metal at the top of the confined layer of molten coating metal.

3,941,907

PARTING AGENT FOR ELASTOMER COMPOSITIONS

Gunter Klement, Dusseldorf-Holthausen; Horst Baumann, Leichlingen, and Eugen Scheidt, Dusseldorf-Holthausen, all of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf-Holthausen, Germany

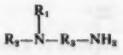
Filed Nov. 28, 1973, Ser. No. 419,600

Claims priority, application Germany, Dec. 22, 1972, 2262916; July 5, 1973, 2334205

Int. Cl.² B28B 7/36

U.S. Cl. 428—341 **3 Claims**

1. In the process of separating sheets of unvulcanized rubber compositions and facilitating the removal of molded vulcanized rubber compositions from a mold comprising applying a thin film of a parting agent to the surfaces of sheets of unvulcanized rubber compositions or the surface of a mold or both and separating said sheets of unvulcanized rubber compositions without self-adhering or separating molded vulcanized rubber compositions from said mold, the improvement consisting of applying a thin film of from 25mg to 5.0gm per square meter utilizing, as said parting agent, a salt of a diamine having the formula



wherein R_3 is alkylene having 2 to 4 carbon atoms and R_1 and R_2 are members selected from the group consisting of hydrogen, alkyl having 1 to 8 carbon atoms and one hydrogen and one alkyl having 1 to 8 carbon atoms, with an anion component having the formula

where X^- is an anion selected from the group consisting of $-SO_3^-$ and $-OSO_3^-$ and R is selected from the group consisting of monoalkylsulfates having from 6 to 26 carbon atoms, monoalkenylsulfates having from 6 to 26 carbon atoms, monoalkadienylsulfates having from 6 to 26 carbon atoms, sulfuric acid half esters of fatty alcohol ethoxylates having 1 to 20 mols of ethylene oxide adducted to 1 mol of a fatty alcohol having 6 to 26 carbon atoms, alkylbenzensulfonates having 4 to 12 carbon atoms in the alkyl, olefinsulfonic acids having 6 to 26 carbon atoms and α-sulfo fatty acid esters with alkanols having 1 to 4 carbon atoms, where the fatty acids have from 6 to 22 carbon atoms, dissolved in an aqueous solution in a concentration of 0.1% to 10% by weight.

3,941,908

STRAND MATERIAL COVERED WITH CLEAR FLAME RETARDANT COMPOSITION AND METHODS OF MAKING

Maheshkumar Parmananddas Valia, Hightstown, N.J., and William Charles Vesperman, Baltimore, Md., assignors to Western Electric Company, Inc., New York, N.Y.

Division of Ser. No. 339,461, March 8, 1973, abandoned. This application June 18, 1974, Ser. No. 480,333

Int. Cl.² B05D 5/12; C08K 5/15, 5/49, 5/10

U.S. Cl. 428—379 **16 Claims**

1. An elongated material provided with covering of a clear flame retardant composition which includes a polymeric material consisting essentially of at least 80 percent, by weight of polyvinyl chloride; 10 to 40 parts by weight of a low molecular weight monomeric plasticizer selected from the group consisting of di (N-hexyl-n-decyl) and di-undecyl phthalate plasticizers per 100 parts by weight of the polymeric material; 15 to 40 parts by weight of a phosphate plasticizer selected from the group consisting of triaryl phosphate and isodecyl diphenyl phosphate, per 100 parts by weight of the polymeric material;

15 to 45 parts by weight of a medium-high molecular weight polymeric polyester plasticizer made from a glycol reacted with a dibasic acid, per 100 parts by weight of the polymeric material; 1 to 5 parts by weight of a metallic stabilizer, per 100 parts by weight of the polymeric material; 0.25 to 1.0 part by weight of a lubricant, per 100 parts by weight of the polymeric material; 0.25 to 1.0 part, by weight of an ultraviolet light absorber per 100 parts by weight of the polymeric material; and 1 to 4 parts, by weight of an epoxy resin, per 100 parts by weight of the polymeric material wherein the combined parts by weight of the plasticizers is at least 50 parts by weight per 100 parts by weight of the polymeric material.

3,941,909

PROCESS FOR IMPROVING THE ADHESIVE PROPERTIES OF ETHYLENE-PROPYLENE CO- AND TER POLYMERS

Löwhardt A. A. Schoen, Geleen, and Franciscus A. Busschers, Spaubeek, both of Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Filed June 19, 1974, Ser. No. 481,121

Claims priority, application Netherlands, June 28, 1973, 7309001

Int. Cl.² B32B *27/32*

U.S. Cl. 428—424 8 Claims

1. A process for improving the adhesive properties of a surface of a body derived from copolymers or terpolymers of ethylene and propylene which comprises applying to the surface a layer of a primer containing an isocyannate-terminated prepolymer which is the reaction product of a rubber-like, hydroxyl-containing alkadiene-derived polymer and an organic diisocyanate, wherein the ratio of diisocyanate to every moleequivalent of the hydroxyl groups in the rubber-like polymer is at least 0.9 mole diisocyanate:1 mole equivalent of hydroxyl group.

3,941,910

OIL-COATED METAL SHEET

Hidejiro Asano, and Yoshitaka Hiromae, both of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation of Ser. No. 178,809, Sept. 8, 1971, abandoned. This application Aug. 14, 1973, Ser. No. 388,890

Claims priority, application Japan, Sept. 10, 1970, 45-78832

Int. Cl.² B32B *15/04, 9/04*

U.S. Cl. 428—457 2 Claims

1. An oil-coated metal sheet coated with a surface coating oil in an amount of 0.05 – 1.0 g/B.B., said surface coating oil comprising diisodecyl phthalate and 0.1 – 5% of one or more of a fatty acid having 14 to 18 carbon atoms.

3,941,911

THERMALLY RESISTANT MAGNETIC TAPE

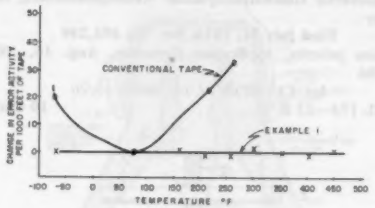
Gerald S. Newton, Graham, Tex., assignor to Graham Magnetics Incorporated, Graham, Tex.

Filed Nov. 19, 1973, Ser. No. 416,884

Int. Cl.² H01F *10/02*

U.S. Cl. 428—525 23 Claims

1. A magnetic tape comprising a substrate formed of a synthetic organic resin, a first magnetic-pigment-containing coating on one side of said substrate and a second non-magnetic-conductive-pigment-containing coating on the other side of said substrate wherein one of said coatings has a polyester polyurethane resin matrix and the other of said coatings has a polyether polyurethane resin matrix and wherein said magnetic pigment is readable after exposure to temperatures



at or above 400°F; and wherein said tape, when reeled has a heat resistance of at least 400°F.

3,941,912

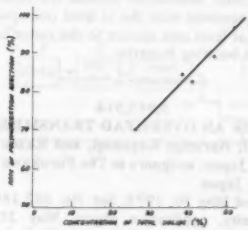
COPOLYMER LATEX AND PAPER COATING COMPOSITION THEREOF

Shigeru Tajima, Ashiya; Takeshi Shimamura, Niihama; Kojiro Matsumoto, Takarazuka; Sadao Sekiguchi, Ikeda; Tanoshi Yamagoshi, and Kazumasa Fjieda, both of Niihama, all of Japan, assignors to Sumitomo Naugatuck Co., Ltd., Osaka, Japan

Filed Sept. 13, 1973, Ser. No. 396,923

Int. Cl.² C08L *9/08, 25/14, 29/08, 33/00*

U.S. Cl. 428—537 5 Claims



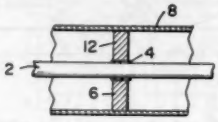
1. A copolymer latex comprising 25 to 45 percent by weight of a conjugated diolefinic monomer, 3 to 40 percent by weight of an alkyl ester of an unsaturated carboxylic acid, selected from the group consisting of methyl acrylate, methyl methacrylate, ethyl acrylate, ethyl methacrylate, butyl acrylate, cyclohexyl acrylate, glycidyl methacrylate, dimethyl fumarate, diethyl fumarate, dimethyl maleate, diethyl maleate, dimethyl itaconate, monomethyl fumarate, monoethyl fumarate and mixtures thereof, 1 to 5 percent by weight of a hydroxyalkyl-containing unsaturated monomer selected from the group consisting of β-hydroxyethyl acrylate, β-hydroxyethyl methacrylate, hydroxypropyl acrylate, hydroxypropyl methacrylate, hydroxybutyl acrylate, hydroxybutyl methacrylate, 3-chloro-2-hydroxypropyl methacrylate, di(ethylene glylcol) itaconate, di(propylene glycol) itaconate, bis(2-hydroxypropyl) itaconate, bis(2-hydroxyethyl itaconate, bis(2-hydroxyethyl) fumarate, bis(2-hydroxyethyl) maleate, 2-hydroxyethyl methylfumarate, 2-hydroxyethyl vinyl ether, hydroxymethyl vinyl ketone, allyl alcohol and mixtures thereof, 0.5 to 4 percent of an unsaturated carboxylic acid monomer and the remaining percent of an alkenyl aromatic monomer.

3,941,913

COAXIAL HIGH FREQUENCY CABLE

Heinz Buschkamp, Hannover, Germany, assignor to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Germany

Filed July 31, 1974, Ser. No. 493,249
Claims priority, application Germany, Aug. 16, 1973, 2341386
Int. Cl.² H01B 11/18; H02G 15/20
U.S. Cl. 174—23 R 10 Claims



1. A process for producing a coaxial high frequency cable, formed of an inner conductor, an outer conductor, and a spacer between the inner conductor and outer conductor, which is bonded thereto, comprising:

applying a first bonding material in the form of at least one molded ring on the inner conductor;

mounting at least one distance spacer on the at least one molded ring;

bonding the at least one spacer to the inner conductor by the at least one molded ring of bonding material;

applying a second bonding material on at least one of the inner surface of the outer conductor and the portion of the at least one spacer to be bonded to the outer conductor;

placing the outer conductor around the inner conductor and in engagement with the at least one spacer; and

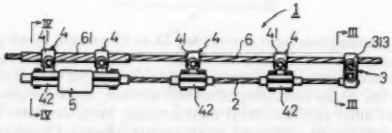
bonding the at least one spacer to the outer conductor by the second bonding material.

3,941,914

DAMPER FOR AN OVERHEAD TRANSMISSION LINE

Masanori Oishi; Harusige Koyanagi, and Kazuo Matsumoto, all of Nikko, Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

Filed May 30, 1975, Ser. No. 582,159
Claims priority, application Japan, May 31, 1974, 49-61637; Apr. 1, 1975, 50-38538
Int. Cl.² H02G 7/14
U.S. Cl. 174—42 16 Claims



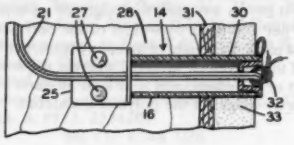
1. A damper for an overhead transmission line comprising a torsional bar disposed in a spaced and parallel arrangement with conductor means of an overhead transmission line; a fixture spacer fixing one of the ends of said torsional bar to said conductor means of said overhead transmission line; at least one bearing spacer loosely bearing the other end of said torsional bar on said conductor means of said overhead transmission line so that said torsional bar is allowed to be twisted; and a pair of weights having an equal inertia moment and secured to said torsional bar adjacent to the torsional end and on either side thereof.

3,941,915

SWITCH RECEPTACLE

Paul B. Boghosian, 937 Dickran Drive, Tulare, Calif. 93274

Filed Aug. 26, 1974, Ser. No. 500,567
Int. Cl.² H02G 3/22
U.S. Cl. 174—48 8 Claims



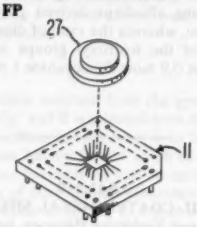
1. A receptacle for a switch comprising a tubular body for the extension of wires longitudinally therethrough and providing an end dimensioned to receive a switch frictionally fitted thereon, means borne by the tubular body for mounting said body in a wall with said end outwardly disposed, and a plug removably, frictionally fitted on said end of the body and having an aperture through which wires can be extended temporarily to hold the wires in place prior to receipt of a switch on said end.

3,941,916

ELECTRONIC CIRCUIT PACKAGE AND METHOD OF BRAZING

Robert Spitler Morse, La Mesa, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Dec. 26, 1974, Ser. No. 536,443
Int. Cl.² H05K 5/00
U.S. Cl. 174—52 FP 7 Claims



1. A method of affixing gold-plated electrical lead pins within pin receiving holes disposed in a ceramic layer of an electronic package assembly comprising the steps of:

depositing palladium-silver on the interior surfaces defining the holes;

depositing gold on said palladium-silver;

positioning a plurality of gold-plated pins within the holes; and

brazing the gold-plated pins within the holes with a gold-germanium solder.

6. An electronic device package comprising:

a ceramic layer having opposing surfaces with a plurality of holes communicating with said surfaces;

an electronic device mounted on one of said surfaces of said layer;

an array of electrical leads overlying said one of said surfaces of said layer, one end of each lead communicating with a respective hole and the other end of each lead electrically interconnected to said electronic device;

a plurality of electrical lead pins, each pin being disposed in one of said holes; and

a metallurgical joint integrally securing each of said pins to the ceramic layer, said joint comprising: a palladium-silver layer metalized on the surfaces defining said holes; a

gold layer metalized on said palladium-silver layer; a gold layer plated on said pins; and a brazed joint joining both of said gold layers, said brazed joint formed of a gold-germanium filler metal.

3,941,917

ELECTRICAL JUNCTION BOX ASSEMBLY

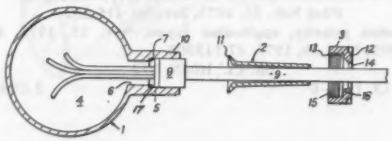
John Samuel Barrow, Mottram, via Hyde; Allen Radcliffe, Stockport, and Donald Taylor, Staleybridge, all of England, assignors to Fosroc A.G., Switzerland

Filed June 20, 1974, Ser. No. 481,024

Claims priority, application United Kingdom, June 29, 1973, 31191/73

Int. Cl.² H02G 3/08

U.S. Cl. 174—65 SS 3 Claims



1. In combination with a conduitless electrical wire of relatively small diameter and having a larger diameter electrical component connected to one end thereof, an electrical junction assembled secured to said wire, said assembly comprising a box, a sheath having a flared rim, and a compression ring, said box having at least one wire-receiving limb including a free end having a male thread thereon and formed of synthetic resin, said limb including a first relatively wider diameter opening of sufficient size to receive said electrical component therein and a second relatively narrower opening communicating with said first opening and through which said conduitless electrical wire extends, said first and second openings forming a shoulder at their union, said compression ring including a female thread, said sheath being disposed about said wire with the flared rim thereof abutting the free end of the limb, said compression ring being disposed about said sheath with the female thread thereof in threaded engagement with the male thread of said limb whereby said sheath is compressed into engagement with the wire to form a fluid-tight seal with said box and whereby said electrical component is closely held within the larger diameter opening in said limb between the shoulder and said flared rim.

3,941,918

ELECTRICAL INSULATOR INCLUDING AN INSULATION SHELL HAVING HARDWARE MEMBERS SECURED THERETO BY CEMENT CONTAINING GRAPHITE FIBERS

Olaf Nigol, Etobicoke, and Gordon Rosenblatt, Burlington, both of Canada, assignors to Canadian Porcelain Company Limited, Hamilton, Canada

Filed Jan. 22, 1973, Ser. No. 325,331

Int. Cl.² H01B 17/42, 17/50, 17/64

U.S. Cl. 174—140 C 4 Claims

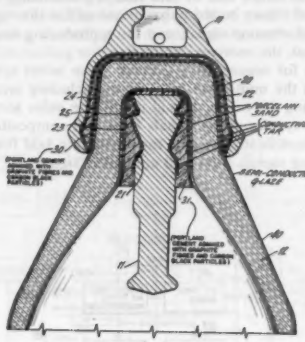
1. An electrical insulator comprising, in combination:

an insulator shell having a semiconducting glaze surface,

first and second conductive hardware members disposed on opposite sides of said insulator shell,

first and second cement layers securing said first and second hardware members to said insulator shell; said first and second cement layers being in electrical contact with said semiconducting glaze surface;

said first and second cement layers having graphite fibres admixed therein and being electrically conductive and defining a current flow path from said first hardware member, through said semiconducting glaze surface, and to said second conductive hardware member;



and a conductive tar coating disposed between said first and second cement layers and the surfaces of said insulator shell to which they adhere.

3,941,919

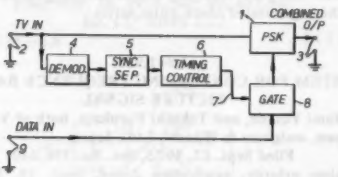
METHOD AND APPARATUS FOR EFFECTING DIGITAL SIGNALLING OVER TELEVISION SIGNAL CHANNELS

Henry Louis Baker, Northwood, England, assignor to Communications Patents Limited, London, England

Filed Aug. 15, 1974, Ser. No. 497,650

Int. Cl.² H04N 7/06

U.S. Cl. 178—5.6 11 Claims



1. A method of effecting digital signalling over a television signal channel which comprises phase shift keying the carrier wave of the television transmission for the duration of a scanning line at the line scanning frequency rate in accordance with the digital information to be signalled and at the receiver determining the phase of said carrier wave during each line of a received television signal relative to a datum phase and generating a digital signal in accordance therewith.

3,941,920

RECEIVER FOR A STILL PICTURE BROADCASTING SIGNAL

Katsuo Mohri, Yokohama; Masaki Fukuda, Kodaira; Tatsuo Kayano, Hachioji, and Takehiko Yoshino, Yokohama, all of Japan, assignors to Hitachi, Ltd.; Hitachi Electronics Co., Ltd. and Nippon Hoso Kyokai, all of Tokyo, Japan

Filed May 20, 1974, Ser. No. 471,823

Claims priority, application Japan, May 23, 1973, 48-56822

Int. Cl.² H04N 5/44, 5/08

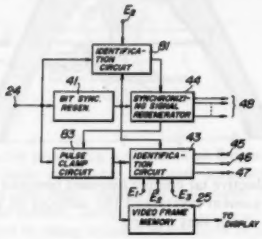
U.S. Cl. 178—5.8 R 6 Claims

1. A receiver for receiving a composite signal including multivalue pulse series which are multivalue pulse code modulated so as to be representative of an information signal to be transferred, a plurality of blanking periods at predetermined positions in said multivalue pulse series, first synchronizing signals each including a binary pulse series of a specified code figure synchronized with said multivalue pulse series of said

information signal, and second synchronizing signals each located to follow one of said first synchronizing signals and formed of binary coded pulses required for the reproduction of the information signal, and for reproducing said information signal, the receiver comprising:

means for regenerating a clock pulse series synchronized with the multivalue pulse series including means for detecting the timing of said multivalue pulse series and the first synchronizing signals from said composite signal;

first identification means for identifying said first synchronizing signals from said composite signal;



means for obtaining pulse signals synchronized with said blanking periods including means for using the first synchronizing signals;

pulse clamping means for pulse clamping said composite signal including means for using the pulse signals; and

second identification means for identifying said multivalue pulse series from the clamped composite signal obtained with said pulse clamping means including means for using the regenerated clock pulse series.

3,941,921

SYSTEM FOR CONVERTING FREQUENCY BAND OF PICTURE SIGNAL

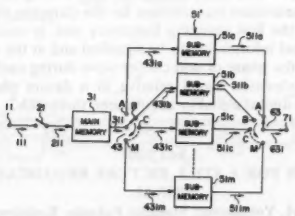
Yasufumi Yumde, and Takashi Furuhata, both of Yokohama, Japan, assignors to Hitachi, Ltd., Japan

Filed Sept. 12, 1973, Ser. No. 396,440

Claims priority, application Japan, Sept. 18, 1972, 47-92929; Sept. 18, 1972, 47-92930

Int. Cl.² H04N 1/28

U.S. Cl. 178—6 **10 Claims**



1. A picture signal band converting system for converting a broad-band picture signal into a narrow-band picture signal comprising a first memory means for recording a picture signal representing one picture and reading out the picture signal repeatedly including a magnetic head, and an endless magnetic recording medium having a capacity of storing a picture signal representing one picture and rotated at a constant speed, a second memory means which has a capacity of storing a picture signal corresponding to at least one scanning line and whose writing and reading speeds are controlled by clock signals, said second memory means being such that such signal can be written therein at the same speed as the speed with which a signal corresponding to one scanning line can be written in or read out from said first memory means, while the signal stored therein can be read out therefrom at any desired speed, means for supplying a picture signal representing one picture to said first memory means for storing said picture signal representing one picture in said first memory means, and means for reading out each individual line signal from said first memory means to write the same in said second memory means, and upon completion of writing, reading out the line signal from said second memory means at a speed lower than the writing speed for delivering same.

3,941,922

FACSIMILE SYSTEM OF RUN-LENGTH

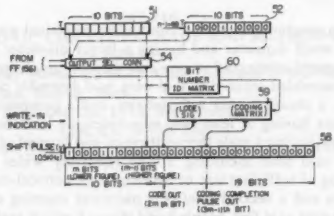
Hiroyoshi Tsuchiya; Kunio Yoshida; Yukifumi Tsuda; Heijiro Hayami, and Hiroaki Kotera, all of Kawasaki, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Nov. 13, 1973, Ser. No. 415,332

Claims priority, application Japan, Nov. 15, 1972, 47-114995; Nov. 15, 1972, 47-115003

Int. Cl.² H04N 7/12

U.S. Cl. 178—6 **2 Claims**



1. In a facsimile transmitter of the type including a facsimile signal generator for developing constant rate facsimile signals comprised of space and mark signals respectively representing space and mark information of an image along a scan line; a pulse generator for generating a sampling pusle train; means receptive of said space and mark signals and responsive to a coding completion signal for developing run-length pulses having durations representative of the durations of said space and mark signals; a sampler receptive of said sampling pulse train and responsive to said run-length pulses for passing said sampling pulses therethrough when enabled by said run-length pulses; counter means for counting those of said sampling pulses passed by said sampler and for storing the count; and a coder for coding the count stored in said counter means into a binary code signal and for developing the coding completion signal when the coding is complete; wherein said counter means comprises:

at least two counters for counting sampling pulses and storing the count therein;

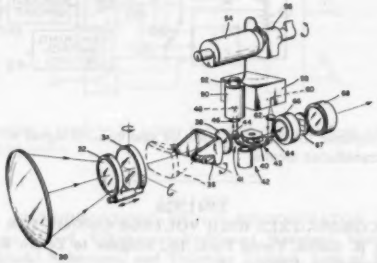
input selector means responsive to said coding completion signal for connecting the output of said sampler to one of said counters and for connecting the output of said sampler to a different one of said counters upon the occurrence of each coding completion signal; and

output selector means responsive to said coding completion signal for connecting the input of said coder with the output of the one of said counters having a count of sampling pulses stored therein and for connecting the input of said coder with the output of another one of said counters having a count of sampling pulses stored therein upon the occurrence of each coding completion signal.

3,941,923
THERMAL IMAGING SYSTEM WITH REDUNDANT OBJECT SPACE SCANNING

Bryce A. Wheeler, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Apr. 1, 1974, Ser. No. 456,938
Int. Cl.² H04N 3/00; H01J 31/49, 39/12
U.S. Cl. 178—6.8 **7 Claims**



1. A thermal imaging system comprising:

a scan generator including scanning means for optically scanning a field of view in a two dimenensional scan pattern such that said scan pattern comprises a given number of interlaced scans of said field of view during each scanning frame period and for applying the received thermal energy to a first location, and imaging means for receiving visible light energy applied from a second location and transmitting said light energy in a two dimensional scene reconstruction pattern such that said scan and reconstruction patterns are synchronized;

an array of detector elements disposed at said first location, with the individual elements of said array forming a given geometrical configuration such that each said detector element receives thermal energy from each point in said field during each scanning frame period, and with each detector element adapted for producing an output signal representative of the relative intensity of thermal energy applied thereto; and wherein said array of detector elements is comprised of groups of detectors with the detectors of each group being disposed along a first direction corresponding to one of said directions of optical scanning and with said groups being disposed along a second direction orthogonal to said first direction such that there is an overlap in the scanning of said groups during each optical scan along said first direction;

an array of light emitting elements disposed at said second location with the individual elements of said array forming the same geometrical configuration as that formed by the elements of said detector array, and with each light emitting element adapted for producing visible light energy as a function of the value of a control signal applied thereto; and means for applying the output signal from each of said detector elements as the control signal to a corresponding light emitting element such that each detector element is electrically coupled to a light emitting element whose location in its array corresponds to the detector element's location in the detector array.

3,941,924
SIMPLIFIED MULTI-CHANNEL DATA SENSOR SYSTEM

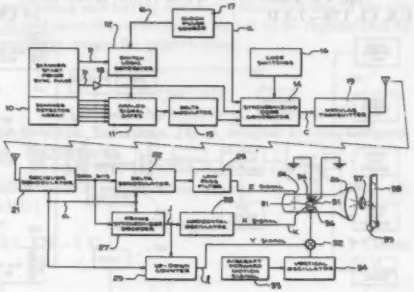
Teague N. Leiboff, Redondo Beach, Calif., assignor to Northrop Corporation, Los Angeles, Calif.

Filed Nov. 25, 1974, Ser. No. 527,128
Int. Cl.² H04N 7/12; H04J 3/02; G08C 15/12
U.S. Cl. 178—6.8 **14 Claims**

1. A system for transmitting analog information sensed by a multi-channel sensor comprising:

sensing means having a plurality of channels each adapted to sense an analog signal,

sampling means for activating each of said channels in successive ascending order and subsequently in successive descending order, and

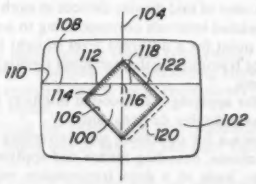


a single analog to digital converter coupled to the outputs of each of said channels for providing a serial train of digital pulses indicative of the magnitude and polarity of said sampled signals.

3,941,925
DIGITAL SOFT EDGE VIDEO TRANSITION SYSTEM

Albert E. Busch, and John R. Hotsenpiller, both of Bloomington, Ind., assignors to Sarkes Tarzian, Inc., Bloomington, Ind.

Filed Mar. 10, 1975, Ser. No. 557,067
Int. Cl.² H04N 5/22
U.S. Cl. 178—6.8 **24 Claims**



1. A soft edge transition system for use with a special effects generator providing transition signals for rendering said transition circuit operative to switch one of first and second video input signals into a video output signal under the control of synchronizing signals, said transition circuit comprising:

means responsive to said transition signal for gradually switching said fist video input signal out of said video output signal and switching said second video input signal into said video output signal;

means responsive to said synchronizing signals and said switching means for determining the time interval between a predetermined datum and the completion of the gradual switching by said switching means;

means for generating an intermediate point signal representative of a predetermined point in the interval between synchronizing signals; and

means operatively coupled to said switching means and responsive to said intermediate point signal generating means and said time interval determining means for rendering said switching means operative gradually to switch said second video input signal out of said video output signal and said first video input signal into said video output signal.

3,941,926

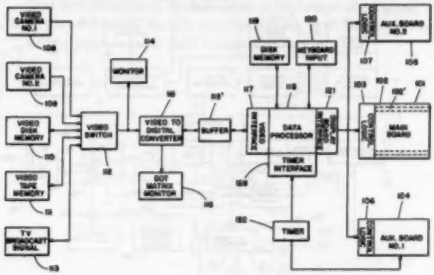
VARIABLE INTENSITY DISPLAY DEVICE

Gregory E. Slobodzian, Chicago; Stanley A. Zielinski, Villa Park, and Robert A. Payne, Des Plaines, all of Ill., assignors to Stewart-Warner Corporation, Chicago, Ill.

Filed Apr. 8, 1974, Ser. No. 458,850

Int. Cl.² H04N 3/16; G09B 13/00; G08B 23/00

U.S. Cl. 178—7.3 D 14 Claims



1. A system for displaying images on a plurality of visual display devices operated by application of a periodic power waveform, including means for applying said periodic power waveform to said system, said display devices arranged in modules to form a full display matrix capable of at least eight levels of light intensity comprising:

a. a source of video signals;

b. a video to digital converter producing digitally coded signals representing said video signals;

c. means for receiving and storing a full matrix of said digital signals;

d. means for extracting the stored digital signals;

e. means for decoding the transmitted signals only during selected intervals on said power waveform to produce intensity level information for initiating operation of selected ones of said display devices at each interval, each of said selcted intervals corresponding to a display device turn on point for a different level of light intensity;

f. means for transmitting the extracted signals to said decoding means;

g. means for applying the decoded intensity level information to said display devices; and

h. clock means for operating said extracting means, transmitting means, decoding means and applying means on a real time basis at a data transmission rate sufficiently greater than the frequency of the periodic power waveform that said applying means completely applies the decoded intensity level information to the selected display devices during the occurrence of each power waveform interval

whereby each display device is energized at the proper interval on the power waveform to accurately reproduce the applied intensity level information.

3,941,927

OPTICAL FIBER DEFLECTION DEVICE

James T. Russell, Richland, Wash., assignor to Battelle Development Corporation, Columbus, Ohio

Filed Nov. 11, 1974, Ser. No. 522,702

Int. Cl.² G02B 5/14; G01D 5/26; H04N 1/04, 3/04

U.S. Cl. 178—7.6 14 Claims

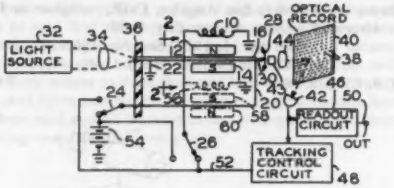
1. An optical fiber deflection device comprising:

optical fiber means for transmitting a light beam therethrough;

electrical transducer means for deflecting at least one end of said fiber means in response to an electrical control signal to deflect said light beam;

said transducer means including a nonmagnetic deflector means attached to said fiber means for deflection of said fiber means by movement of said deflector means; and

means for connecting said deflector means to an electrical current source so that said deflector means is moved in



response to the application of said control signal to said transducer means.

3,941,928

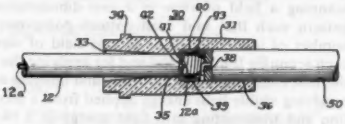
CORONA-FREE HIGH VOLTAGE CONNECTOR

Jagjit R. Gaind, Forest Park, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Apr. 3, 1975, Ser. No. 564,937

Int. Cl.² H01L 23/48; H04N 5/64; H01R 11/04

U.S. Cl. 178—7.8 5 Claims



1. For use in the high voltage system of a television receiver in which a locally generated high amplitude alternating polarity signal is converted to a single polarity electron accelerating potential by a rectifying device having one end terminating in an electrical conductor, connecting means for producing a substantially air-tight, corona-free connection to said rectifying device comprising:

wire means having a conductor and surrounding insulator;

a contact mechanically and electrically connected to said conductor;

a resilient sleeve, having first and second ends, retaining said contact intermediate said ends with said wire means extending from said second end of said sleeve, said contact and the inner surface of said sleeve between said contact and said first end, forming a receptacle; and

an axially compressible spring, positioned in said receptacle, said resilient sleeve conforming to and grasping said one end of said rectifying device upon its insertion into said receptacle to compress said spring and electrically connect said one end of said rectifying device to said contact within said receptacle.

3,941,929

TRANSCODER FOR DIGITAL DIFFERENTIAL PHASE MODULATION

Claude Aillet, Lannion, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, France

Filed July 15, 1974, Ser. No. 488,657

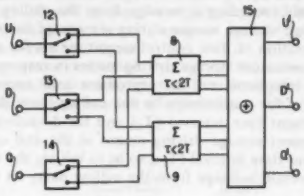
Claims priority, application France, July 13, 1973, 73.25850

Int. Cl.² H04L 27/24

U.S. Cl. 178—67 6 Claims

1. Transcoder for digital differential phase modulation for m binary input pulse trains, m being an integer, characterized in that it comprises a plurality of accumulators each having m inputs, cyclic distributor means for feeding the consecutive

pulses of each pulse train, in a cyclic manner, to a respective input of each accumulator in succession and adder means



including a modulo 2^m adder for adding the contents of said accumulators.

3,941,930

SYNCHRONIZING SIGNAL REGENERATOR

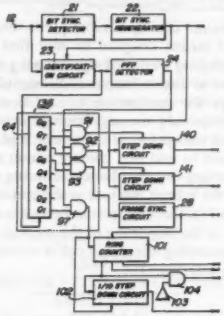
Katsuo Mohri, Yokohama; Yoshizumi Watatani, Machida; Hiroaki Nabeyama, and Takehiko Yoshino, both of Yokohama, all of Japan, assignors to Hitachi, Ltd. and Nippon Noso Kyokai, both of Tokyo, Japan

Filed Apr. 15, 1974, Ser. No. 460,971

Claims priority, application Japan, Apr. 18, 1973, 48-43183

Int. Cl.[2] H04L 7/00

U.S. Cl. 178—69.5 R 7 Claims



1. A synchronizing signal regenerator for regenerating synchronizing signals in a composite signal including a video signal and pulse code modulated audio multiplex signals transmitted in a predetermined sequence, and further including first synchronizing signals having a predetermined number of pulses synchronized with a modulated pulse series of said audio multiplex signals and forming a fixed pulse pattern, and pulse code modulated second synchronizing signals located following said first synchronizing signals and including a plurality of other synchronizing signals required for the reproduction of said video and audio multiplex signals, wherein said first and second synchronizing signals are inserted in said video and audio multiplex signals and transmitted at a predetermined period, the regenerator comprising:

first means for detecting said fixed pulse pattern of said first synchronizing signals and for regenerating a first signal synchronized with said transmitted period of said first synchronizing signals;

second means for detecting predetermined synchronizing signals of said second synchronizing signals which are located in predetermined positions thereof including means for using said regenerated first signal as a reference, and for regenerating second signals each synchronized with said predetermined synchronizing signals of said second synchronizing signals

means for dividing the frequency of at least one of said regenerated second signals; and

first means for regenerating the rest of said second synchronizing signals including means for obtaining synchronization of said frequency divided signal with another signal regenerated by said second means for detecting and regenerating and having common phase with one of the rest of said second synchronizing signals to be regenerated by said first means for regenerating.

3,941,931

AUDIO SIGNAL MIXING SYSTEM

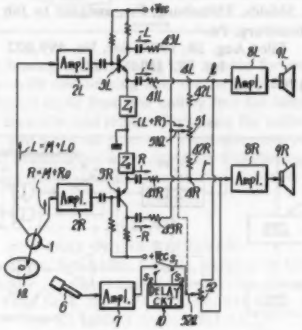
Yoshio Osakabe, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Feb. 11, 1974, Ser. No. 441,206

Claims priority, application Japan, Feb. 12, 1973, 48-18303[U]

Int. Cl.[2] H04R 5/00

U.S. Cl. 179—1 G 9 Claims



1. An audio signal mixing system comprising:

a. left and right channels for transmitting stereophonic left and right signals L and R each, respectively, containing a monaural signal;

b. a first circuit for eliminating said monaural signal contained in either one of said left and right signals L and R; and

c. a second circuit supplied with an additional signal and mixing it with either one of said left and right signals L and R, whereby said either one of said left and right signals L and R and said additional signal are passed by one of said left and right channels, and the other one of the L and R signals and the monaural signal are passed by the other channel.

3,941,932

LOUDSPEAKER HAVING A VOICE COIL AND A PIEZOELECTRIC FEEDBACK TRANSDUCER

Guido Odilon Maurits D'Hoogh, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 29, 1974, Ser. No. 474,450

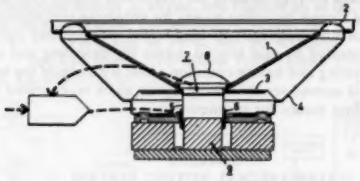
Claims priority, application Netherlands, June 12, 1973, 7308103

Int. Cl.[2] H04R 3/08, 23/02

U.S. Cl. 179—1 F 10 Claims

1. A loudspeaker comprising, a cone-shaped vibratory diaphragm having an inner portion secured to a coil form, a voice coil mounted on the coil form, means including the voice coil for vibrating the coil form and diaphragm, a piezoelectric transducer mounted on the coil form and comprising a thin plate of piezoelectric material having two opposed edges hingedly connected to the coil form and situated within the circumference of said voice coil and with its major surfaces

lying in a plane substantially normal to the axis of the voice coil, and means for degeneratively coupling the output voltage



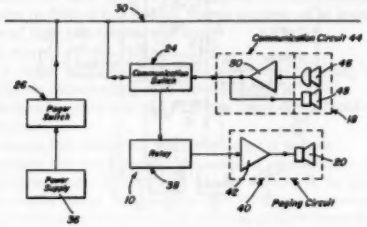
of the piezoelectric transducer to an input of an amplifier adapted to drive the voice coil.

3,941,933

PAGING INTERCOMMUNICATION SYSTEM

Roger W. Shields, Ebensburg, Pa., assignor to Jab Company, Inc., Ebensburg, Pa.

Filed Aug. 20, 1974, Ser. No. 499,022
Int. Cl.² H04M *13/00*
U.S. Cl. 179—1 H 15 Claims



1. In an intercom system having a common signal cable to which a plurality of communication units are connected, each of said units including a source of electrical energy connected to said cable for normally maintaining a relatively low d.c. operating potential thereon, a paging circuit having an output speaker, through which incoming audio signals are reproduced, sensing means responsive to a relatively high d.c. driving voltage applied to the signal cable with said incoming audio signals for connecting the paging circuit thereto to reproduce the incoming audio signals, a communication circuit having input and output transducers through which incoming and outgoing audio signals are respectively reproduced and generated, communicate switch means for connecting the signal cable to the communication circuit and simultaneously disabling the sensing means, and pager switch means interconnected between the signal cable and said source of electrical energy for selectively applying said d.c. driving voltage to the signal cable while the outgoing audio signals are being generated in the communication circuit.

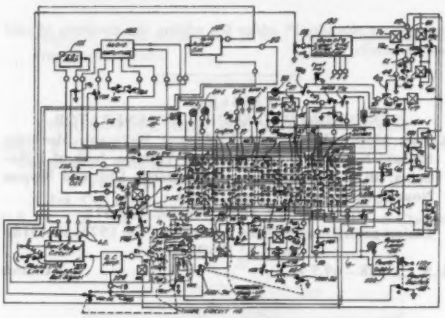
3,941,934

TELEPHONE ANSWERING SYSTEM

Elmer C. Bonsky, Columbus, Ohio, assignor to T.A.D. Avanti, Inc., Paramount, Calif.

Filed Sept. 13, 1973, Ser. No. 396,718
Int. Cl.² H04M *1/64*
U.S. Cl. 179—6 R 2 Claims

1. In a telephone answering system for responding to telephone calls received over a telephone line and which comprises an announcement storage means and a message storage means and respectively associated transducers, and first and second means for driving said announcement storage means and said message storage means respectively relative to said transducers for producing a recorded announcement from the announcement storage means in response to an incoming telephone call during an announcement interval (T_1) and for subsequently recording a message from the calling party on said message storage means during a message interval (T_2), the combination of: first control circuit means for activating said announcement storage driving means in response to said incoming telephone call to reproduce said recorded announcement for transmission to the calling party during the announcement time interval (T_1) and for de-activating said announcement storage driving means at the end of the announcement time interval (T_1), so as to initiate the recording of the aforesaid message from the calling party on said mes-



sage storage means during a subsequent time interval (T_2); second control means coupled to said first control circuit means for developing a control signal during the time interval (T_2) in response to discontinuous audio signals corresponding to said message for application to said first control circuit means to maintain said message storage driving means activated as long as said message continues; and hang-up circuit means connected to said first control circuit means for effectively disconnecting the telephone answering system from the telephone line for a brief interval at the end of the announcement interval (T_1), thereby to re-establish a dial tone on the telephone line at the beginning of the message interval (T_2) in the event the incoming telephone call is terminated during the announcement interval (T_1).

3,941,935

CENTRALIZED DEBITING SYSTEM FOR TDM TELECOMMUNICATION NETWORK

Arnaldo Vicentini; Francesco Maschi, and Guido Arrigoni, all of Milan, Italy, assignors to Societa Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed Apr. 24, 1974, Ser. No. 463,761
Claims priority, application Italy, Apr. 24, 1973, 23360/73
Int. Cl.² H04M *15/00*
U.S. Cl. 179—15 AT 10 Claims

1. In a time-division-multiplex telecommunication system including an exchange serving a multiplicity of subscriber lines, in combination:

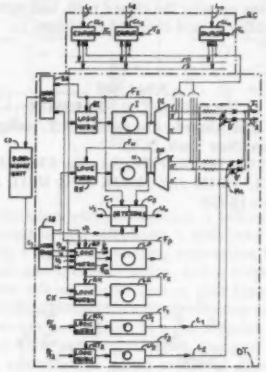
central-office equipment at said exchange for establishing a connection between a calling subscriber and a called subscriber, at least some connections so established being toll calls to be debited to participating subscribers, said equipment including a group of synchronously circulating memories for the temporary storage of data relating to the progress of a multiplicity of connections concurrently established in respective time slots of a recurrent communication frame, each of said memories having an operating cycle coextensive with said frame and subdivided into a multiplicity of phases corresponding to the time slots of said frame;

supervisory means operative upon the stablishment of a toll call in one of said time slots for generating a succession

of rate pulses indicative of the number of toll units to be charged to the account of a subscriber participating in said toll call;

circuit means connecting said supervisory means to one memory of said group for registering a characteristic entry in a phase thereof, assigned to said toll call, in response to a rate signal;

counting means controlled by said circuit means for preserving said characteristic entry in said assigned phase for a predetermined number of operating cycles;



pulse-generating means controlled by said one memory for emitting a voltage pulse upon each occurrence of each characteristic entry in successive operating cycles;

integrating means connected to said pulse-generating means for converting a train of said voltage pulses into a single charge pulse; and

output means connected to said integrating means for delivering said charge pulse to the line of the participating subscriber to be debited for the toll call.

3,941,936

TELECOMMUNICATION SYSTEM USING TDM SWITCHING

Keith Graham, Kitchener; Viacheslav Korsky; Christopher Elmer, both of Guelph, all of Canada; Edouard Pinede, Norwalk, Conn.; John Litster, Guelph, and Jan Aarts, Kitchener, both of Canada, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Oct. 4, 1974, Ser. No. 512,061

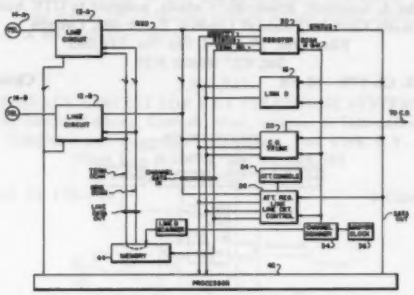
Claims priority, application Canada, Oct. 19, 1973, 183674

Int. Cl.[2] H04J *3/00*

U.S. Cl. 179—15 AT **12 Claims**

1. A telecommunications exchange comprising a central control including a processor and a memory, and a plurality of stations; said memory comprising means for storing numbers of a calling one of said stations and a called one of said stations, said storing means comprising a recirculating memory having as its capacity a first predetermined number of memory areas with each memory area comprising storage for calling and called station numbers, means operative with one of said memory areas for transferring memory information for processing by said processor, means in said processor responsive to input information received from a calling station for enabling routing a call in conjunction with data from a second memory area, and means in a third memory area for again storing call data in said memory for recirculation.

8. A time division telecommunications exchange wherein there are a plurality of time channels comprising a time frame, a plurality of circuits for supervising exchange functions with each of said channels representing a separate one of said function circuits, means operative during each time channel for storing calling and called line data on calls being handled by the associated function circuit, line scanner means operative at the conclusion of each time frame to scan one line for call service request, a register comprising one of said function circuits, means operative during the time frame subsequent to



a line scan finding a line seeking call service for associating said register with said seeking line, means in said register for receiving dialed digits from the calling line for identifying a called line, means in said register for testing the called line for availability, and a central processor responsive to a called line being found available on said testing for transferring the call being serviced from said register to a further function circuit.

3,941,937

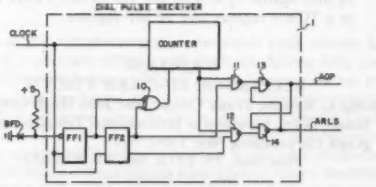
DIAL PULSE RECEIVER

John A. Gauthier, Brockville, Canada, assignor to GTE Automatic Electric (Canada) Limited, Brockville, Canada

Filed Sept. 27, 1974, Ser. No. 510,080

Int. Cl.[2] H04Q *3/42;* **H04J** *3/12*

U.S. Cl. 179—18 EB **7 Claims**



1. An improved dial pulse receiver for a register and sender arrangement of a communication switching system, said arrangement comprising a plurality of registers and senders, a single clock source producing a single train of clock pulses, and a battery feed device, wherein dial pulses are received by said dial pulse receiver from the battery feed device contact and transmitted from said dial pulse receiver to said registers, said improved dial pulse receiver comprising:

counter means directly connected to said clock pulses;

flip-flop means directly connected to said clock pulses and said dial pulses;

counter reset means coupled to said counter means and to said flip-flop means; and

gate output means coupled to said flip-flop means and to said counter means;

whereby on receiving a dial pulse the output of said flip-flop means is input to said reset means to reset said counter means and said output being also input to said gate output means, on reaching a predetermined count the output of said counter means enabling said gate output means to transmit a legitimate dial pulse signal if said flip-flop means output is still present at said gate output means or

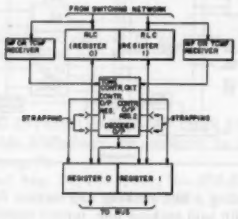
a no legitimate signal being transmitted from said gate output means if said flip-flop means output is no longer present.

3,941,938

TIME SHARED TCMF AND MF DECODER

John A. Gauthier, Brockville, Canada, assignor to GTE Automatic Electric (Canada) Limited, Brockville, Canada

Filed Sept. 27, 1974, Ser. No. 510,083
Int. Cl.² H04M 3/38
U.S. Cl. 179—18 EB 5 Claims



1. An improved decoder for a register and sender arrangement of a communication switching system, said arrangement comprising a plurality of registers and senders, a clock, TCMF and MF receivers, wherein TCMF, MF, and DP pulses are received by said receivers, and said TCMF and MF signals are transmitted to said decoder, said improved decoder comprising:

TCMF decoder control means;

MF decoder control means;

common TCMF and MF decoder means for decoding both TCMF and MF signals; and

time sharing control means coupled to said TCMF and said MF decoder control means;

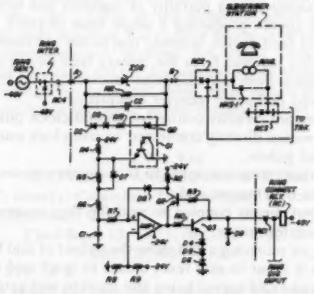
whereby said common TCMF and MF decoder means may be time shared by at least two MF or two TCMF registers or a TCMF register and an MF register.

3,941,939

ELECTRONIC RING TRIP CIRCUIT

Phillip L. Holmes; Frank Cinkus, and John Hugh Green, all of Milan, Tenn., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Nov. 25, 1974, Ser. No. 526,633
Int. Cl.² H04M 3/02
U.S. Cl. 179—18 HB 7 Claims



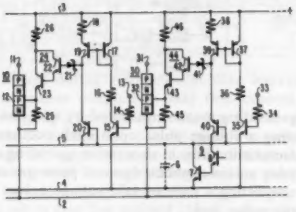
1. A ring control circuit for a telephone line to which alternating current ringing signals are applied from a ring signal source, including a ring connect relay operated responsive to ring signal input to close a path from said source to said telephone line and to a ring trip portion of said circuit, means for latching said relay in its operated condition, direct current detecting means responsive to rectified alternating current ring signals for maintaining the charge on a capacitor beyond a threshold level, means responsive to direct current through said line resulting from a closed loop condition of said line for causing the direct current and superimposed rectified ringing current to cause the charge on said capacitor to pass said level, an operational amplifier responsive to the charge of said capacitor passing said threshold for changing condition to release said latching means to cause release of said relay, said relay on release opening the closed path, and means for latching said amplifier in said changed condition.

3,941,940

TRANSIENT SUPPRESSOR

Adel Abdel Aziz Ahmed, Annandale, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 6, 1974, Ser. No. 530,403
Int. Cl.² H04M 3/00; H03K 5/20; H01L 21/00
U.S. Cl. 179—18 GF 7 Claims



1. In a cross-point switch array with a plurality of four-layer devices having their anode-to-cathode paths connected as switching and latching elements between COLUMN and ROW busses and having their respective gate electrodes connected to receive COMMAND pulses of current from respective COMMAND signal lines for triggering their respective anode-to-cathode paths into conduction, triggering circuitry immune to false triggering brought about by transient pulses of shorter duration than said COMMAND pulses, said triggering circuitry comprising:

a plurality, N in number, of switchable current sources each for being activated by a COMMAND or transient pulse applied thereto from a respective COMMAND signal line;

a diode OR gate having a plurality, N in number, of input terminals, each connected to a separate one of said switchable current sources, and having an output terminal;

a capacitance connected between said OR gate output terminal and a point of potential to which the cathodes of said four layer devices are referred, for integrating said transient pulses; and

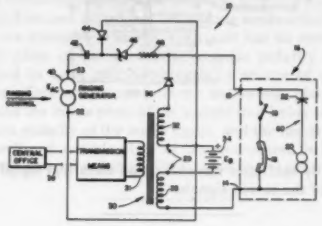
a plurality, N in number, of threshold potential breakdown devices, each connected between a respective one of said OR gate input terminals and the gate electrode of a respective one of said four-layer devices. their threshold potentials for breakdown being chosen sufficiently low that COMMAND pulses as integrated by said capacitance are large enough to overcome these threshold potentials and being chosen sufficiently high that transient pulses as integrated by said capacitance are too small to overcome these threshold potentials.

3,941,941

RELAYLESS SWITCHING CIRCUIT FOR APPLICATION OF RINGING SIGNALS

Frank L. Simokat, Euless, and Lucian W. Spencer, Arlington, both of Tex., assignors to Superior Continental Corporation, Hickory, N.C.

Filed Sept. 27, 1973, Ser. No. 401,418
Int. Cl. H04m 1/26
U.S. Cl. 179—84 R 15 Claims



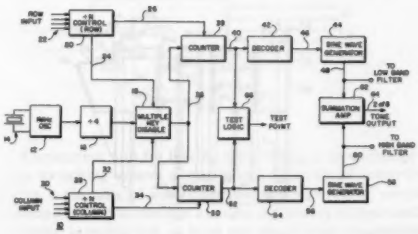
1. In combination with a telephone, a talking circuit normally connected to said telephone, a telephone transmission line providing a signal-transmitting connection between said talking circuit and a central office, and a ringing generator located at the talking circuit end of said transmission line remote from said central office for developing an a.c. voltage in response to the occurrence of a pre-selected signal which is transmitted from said central office to signal an incoming call to said telephone, a static switching circuit rendered effective by said a.c. voltage (a) to convert said a.c. voltage into a pulsating d.c. ringing voltage and to apply said pulsating ringing voltage to said telephone to operate a signaling device in said telephone and (b) to effectively electrically disconnect a portion of said talking circuit from said telephone during application of the pulses of said ringing voltage to said telephone.

3,941,942

TWO OF EIGHT TONE ENCODER

Harold G. Nash, Tempe, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Filed Jan. 2, 1974, Ser. No. 430,377
Int. Cl.² H04M 1/50; H03K 13/02
U.S. Cl. 179—90 K 10 Claims



1. An X of Y tone encoder for synthesizing X selected tone signals at an output thereof, X and Y being integers, including clock signal input means for generating a reference input signal, comprising:

programmable counting circuit means for counting a preselected one of a plurality of up-down sequences coupled to said clock signal input means, wherein an up-down sequence is a repetitive sequence of numbers wherein each number is incremented from the previous number until all bits of a number are logical 1's, and then each number is decremented from the previous number until all bits of a number are a logical 0;

digital-to-analog conversion circuit means coupled to said programmable counting circuit means for converting digital output signals from said programmable counting circuit means to X analog signals; and

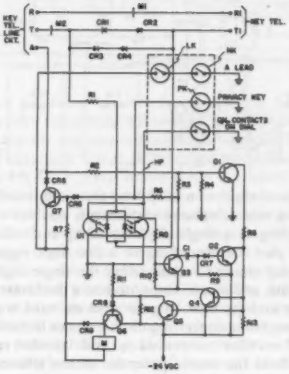
a summation amplifier circuit for summing said X analog signals coupled to said digital-to-analog conversion circuit means for producing a single output signal including X selected tone signals.

3,941,943

PRIVACY CIRCUIT FOR KEY TELEPHONE SYSTEMS

Coy Edwin Matheny, Corinth, Miss., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Aug. 8, 1974, Ser. No. 495,580
Int. Cl.² H04M 1/70
U.S. Cl. 179—99 4 Claims



1. In a key telephone system in which each station has access to a plurality of lines with each line having loop conductors for completing a talkpath from a line to a station and a control lead conductor, and in which said control conductor is in a first condition when its line is idle and a second condition when its line is busy, means responsive to a line becoming busy for applying said second condition to the control conductor of said line, a privacy circuit for each said station including means for sensing said second condition in said control conductor of a line completed to said station, means for enabling said privacy circuit responsive to a sensed second condition, means for latching said privacy circuit in an enabled condition, means for sensing the presence of line current in a line loop of said completed line for causing the operation of a privacy relay in said privacy circuit only when said privacy circuit is not latched, and contacts of said privacy relay for opening the line loop conductors responsive to operation of said relay to prevent access to said line by the station with its relay contacts open.

3,941,944

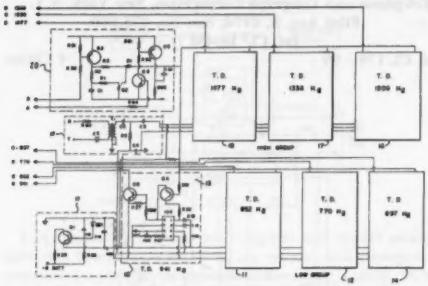
SIGNALLING DEVICE FOR KEY TELEPHONE SYSTEMS

Alexander C. McIntosh, P.O. Box 1673, Bellevue, Wash. 98009

Continuation of Ser. No. 448,036, March 4, 1974, abandoned. This application Apr. 18, 1975, Ser. No. 569,396
Int. Cl.² H04M 1/50
U.S. Cl. 179—99 4 Claims

1. A telephone signalling device comprising tone detection means responsive to signal tones occurring on a telephone line

to which the device is connected, said signal tones emanating from one or more touch-tone telephones connected to said telephone line, means for latching responding tone detection means into the responsive state for a predetermined period of time after detection of a valid signal, said tone detection means being based upon the phase locked loop principle wherein the output of said means is proportional to the phase difference between the tone presented for test and a voltage controlled oscillator, said latching means being controlled by a relaxation circuit which determines the length of time the latch remains activated, and a matrix comprising circuit branches containing switching elements and including relay coils selectively activated by said tone detection means, respective pairs of contact sets operated by said relay coils, each



arranged to connect to a telephone instrument and actuate an indicator at said telephone instrument, one set of each pair corresponding to a single digit signalling code and the other set of the pair corresponding to a two digit signalling code, transfer relay means to select either the single digit sets or the two digit sets, and means responsive to a predetermined signal tone code and its decoding to operate said transfer relay means, comprising energizing circuit means including a silicon controlled rectifier connected to said transfer relay means, means to hold the anode potential of the silicon controlled rectifier below its gate electrode potential before said predetermined signal tone code is received, and means to drop the gate electrode potential sufficiently below said anode potential when said predetermined signal tone code is decoded, to cause the silicon controlled rectifier to conduct.

3,941,945

SIGNAL PLAYBACK SYSTEM TRANSDUCER WITH OPTICAL RESONANCE CAVITY

Manfred Borner; Gisbert Glasmachers, both of Ulm, Danube; Otto Bernecker, Neu-Ulm, Danube; Volker Riemann, Einsingen, and Stefan Maslowski, Aufheim, all of Germany, assignors to TED Bildplatten Aktiengesellschaft, AEG-Telefunken, TELDEC, Zug, Switzerland

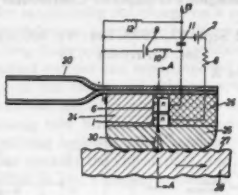
Filed Sept. 10, 1973, Ser. No. 395,456

Claims priority, application Germany, Sept. 8, 1972, 2244119

Int. Cl.² G11B *11/16*

U.S. Cl. 179—100.3 Z **24 Claims**

1. A pickup system for playing back wide-band signals stored on the surface of a carrier in the form of surface deformations extending along a recording track and capable of reflecting laser radiation in a manner which varies as a function of the time pattern of the stored signals, comprising: laser means for producing laser radiation and arranged to be positioned to form, during playback, an optical resonator with the carrier surface such that when said laser means are in operative association with the surface the intensity of the laser radiation oscillations produced by said laser means is influenced by the radiation relfected back to said laser means by the surface and varies as a function of variations in the reflection or scattering of laser radiation back into said laser means from said carrier surface when said laser means undergoes relative movement along the recording track; and output means for converting such intensity variations in the radiation



produced by said laser means into an electrical signal representative of the stored signals.

3,941,946

ELECTROSTATIC TRANSDUCER ASSEMBLY

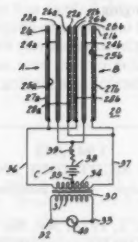
Hirotake Kawakami; Atsushi Matsuda, both of Tokyo, and Kazumasa Takahashi, Chofu, all of Japan, assignors to Sony Corporation, Tokyo, Japan

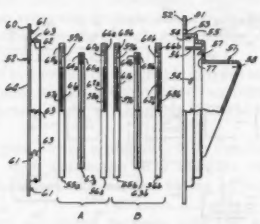
Filed June 6, 1973, Ser. No. 367,579

Claims priority, application Japan, June 17, 1972, 47-71773[U]

Int. Cl.² H04R *19/00*, *19/02*

U.S. Cl. 179—111 R **3 Claims**





1. An electrostatic transducer assembly comprising:

first and second transducer units, each having a pair of apertured plates with conductive coatings and a conductive diaphragm fixedly disposed between the plates at the periphery thereof,

a housing having a recessed region for receiving the two transducer units,

locating pins positioned within the recessed region of the housing and extending outwardly therefrom,

each of the transducer units having locating openings for positioning the unit over the pins in the housing,

means for extending electrical leads from the respective apertured plates and diaphragm through the housing, and means for locking the two transducer units in place over the pins.

2. An electrostatic transducer assembly comprising a first transducer unit consisting of a pair of apertured plates each having a conductive layer and a conductive diaphragm disposed between said plates, a second transducer unit consisting of a pair of apertured plates each having a conductive layer and a conductive diaphragm disposed between said plates, the first and second transducer units being sandwiched together to form an assembly whereby each unit has an outside and an inside plate of the assembly, a single polarity bias source coupled to both said diaphragms, a source of audio signal having a first and second polarity, the outside plate of the first unit and the inside plate of the second unit being supplied with the first polarity of the audio signal, and the inside plate of the first unit and outside plate of the second unit being supplied with the second polarity of the audio signal source.

3,941,947
CONNECTION UNIT FOR TIME DIVISION SWITCHING SYSTEM

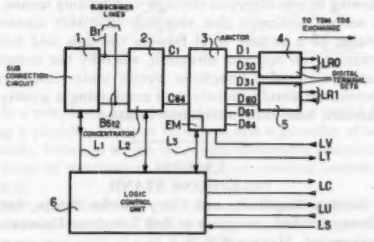
Jean-Baptiste Jacob, Saint-Quay-Perros-Guirec; Roger Renoulin, and Pierre Le Drezen, both of Lannion, all of France, assignors to Societe Lannionnaise d'Electronique Sle-Citeral and Compagnie Industrielle des Telecommunications Cit-Alcatel, both of, France

Continuation-in-part of Ser. No. 267,927, June 30, 1972, abandoned. This application May 14, 1974, Ser. No. 469,849

Claims priority, application France, June 30, 1971, 71.24023

Int. Cl.² H04Q *11/04*

U.S. Cl. 179—15 AT **10 Claims**



1. Connection unit for linking subscribers to an exchange in a time switching system comprising a plurality of subscriber circuits, a plurality of subscriber junction supervisory circuits connected to said subscriber circuits, a plurality of time multiplex digital terminal sets, at least one space-time concentrator connected to said subscriber circuits and a logic control unit operating on a time-sharing basis with said concentrator, said concentrator comprising a concentration network having at least an input stage and an output stage, the input stage consisting of a plurality of groups of switches in variable numbers connected in parallel to said subscriber circuits to adapt the number of inputs of a group to the traffic of the subscriber to be serviced, a junctor set connecting the output stage of said concentrator to said digital terminal sets, and memory means including line and line state memories connected to said junctor set for storing the state of the connections and the orders received from the logic control unit.

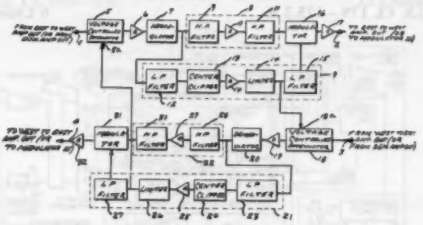
3,941,948
FOUR-WIRE INTERFACE REGULATOR FOR LONG DISTANCE TRUNK CIRCUITS

Fred A. Brooks, 37 Lancaster Ave., Maplewood, N.J. 07040

Filed Nov. 29, 1973, Ser. No. 420,247

Int. Cl.² H04B *3/36*

U.S. Cl. 179—170 R **2 Claims**



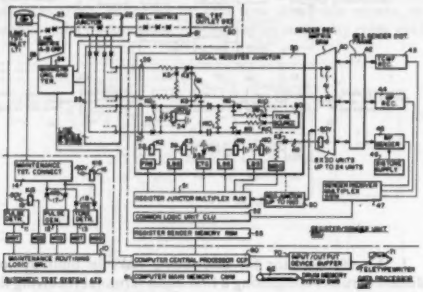
1. A self regulator for interfacing links in built up long distance trunks comprising a first input terminal receiving first electrical signals representative of speech from one of said links, said electrical signal represented by product waves in the form of $f(A)t \times f(B)t$ where f(A)t represents the amplitude of informational signal f(B)t and a high frequency wave f(B)t, a first voltage controlled attenuator passing said electrical signals from said first input, said voltage controlled attenuator having a first control input for variation thereof, a first demodulator receiving the electrical signals from said first voltage controlled attenuator and providing output signals permitting separation thereafter of the signals representative of $f(A)t$ and $f(B)t$, a first low and high pass frequency branch exclusively passing said signals representative of $f(A)t$ and $f(B)t$, respectively, said low pass frequency branch consisting of a series arrangement, in sequence, of a first low pass filter, a center clipper, a first amplifier of preselected gain, a first limiter, and a second low pass filter, said high pass filter consisting of a first high pass filter, a second amplifier of preselected gain, and a second high pass filter, a first modulator for recombining the output signals from said low and high pass frequency branches, a first output terminal for said one link for receiving the recombined signals from said first modulator, a second voltage controlled attenuator having a second control input for variation of the attenuation thereof, said second control input receiving an input signal from said first limiter in response to the presence of an electrical signal at said first input terminal, a second input terminal for said one link receiving second electrical signals representative of speech also having the form of $f(A)t \times f(B)t$ and f(B)t and being received in response to said first electrical signals, a second demodulator receiving said second electrical signals by way of said second voltage controlled attenuator, a second low and high pass frequency branch receiving the output signal from said second modulator and passing exclusively signals representative of $f(A)t$ and $f(B)t$, respectively, said second low pass frequency branch consisting of a series arrangement, in sequence, of a third low pass filter, a second center clipper, a third amplifier of preselected gain, a second limiter, and a fourth low pass filter, said high pass frequency branch consisting of a series arrangement, in sequence, of a third high pass filter, a fourth amplifier of preselected gain, and a fourth high pass filter, said second limiter providing said first control input with a signal to vary the attenuation of said first voltage controlled attenuator, a second modulator receiving simultaneously signals from said second low and high pass frequency branches for recombination and a second output terminal for said one link receiving the recombined signals from said second modulator.

3,941,949

METHOD AND APPARATUS FOR ISOLATING MALFUNCTIONS OCCURRING IN SENDER-RECEIVER COMMUNICATION SWITCHING SYSTEM EQUIPMENT

Howard R. Miller, College Station, Tex.; Leo J. Putchinski, Jr., Wheeling, and Kenneth W. Vanderlei, Wheaton, both of Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Feb. 27, 1974, Ser. No. 446,576
Int. Cl.² H04M *3/24*
U.S. Cl. 179—175.2 R 6 Claims



4. In a communication switching system having a line switching network for establishing connections selectively between calling and called lines under the control of common equipment including a plurality of registers for storing temporarily call processing information received from the calling lines via a plurality of register junctors, a junctor switching network connecting selectively a pool of units comprising sending units and receiving units to the junctors, the common equipment including memory means, an apparatus for isolating malfunctions comprising:

means for establishing a test connection through the junctor switching network between one of said register junctors and one of said units for testing purposes;

testing means;

means for connecting said testing means to the register junctor under test via the line switching network;

means for testing the register junctor under test to determine whether it can operate properly;

means for testing said unit under test with said testing means via said test connection if the junctor was determined to operate properly;

means for establishing subsequently another test connection between a different one of the register junctors and said same unit under test if said unit was determined to operate improperly;

means for testing said unit under test again after establishing said another test connection;

means for determining that said unit under test is faulty if said unit functions improperly for the second test; and

means for determining that said junctor network is faulty if said unit under test functions properly for the second test.

3,941,950

TELEPHONE LINE TESTING INSTRUMENT HAVING A SUPERVISING CAPABILITY

Duane E. Dunwoodie, Los Altos, and Wallace Oliver, Mountain View, both of Calif., assignors to Wiltron Company, Palo Alto, Calif.

Filed May 4, 1973, Ser. No. 357,250
Int. Cl.² H04B *3/46*
U.S. Cl. 179—175.3 R 10 Claims

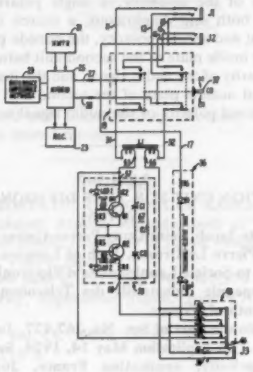
1. A telephone test apparatus comprising in a single unit:

a connector having at least two terminals for establishing electrical contact with a telephone circuit under test,

means including an alternating current test signal transmitter or receiver or a cooperative combination thereof connectible to said at least said two terminals for participating in a test of the quality of a telephone circuit connected thereto,

means having low direct current impedance but high impedance to alternating current signals for holding a telephone circuit in a communicating state, and

electrical circuit means for supervising the communicating state of a telephone circuit under test, said supervising



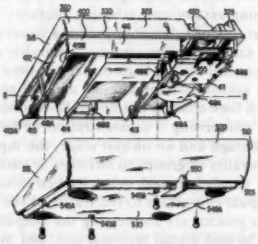
circuit connectible in series with said holding means across said two telephone line connector terminals, said supervising circuit including a first indicator that responds to a direct current in excess of a certain level flowing in one direction through said holding means, and a second indicator that responds to direct current in excess of a certain level flowing through said holding means in an opposite direction, whereby the communicating state of a telephone circuit under test may be monitored simultaneously with conducting a quality test thereon, both from a common location.

3,941,951

TELEPHONE STAND

John Gordon Engstrom, and Gary Merlin Petaja, both of Indianapolis, Ind., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 14, 1974, Ser. No. 469,854
Int. Cl.² H04M *1/02*
U.S. Cl. 179—179 2 Claims



1. A telephone stand comprising:

a cover member and a base member that combine to provide a housing;

a plurality of components contained within the housing;

a chassis completely enclosed within the housing, the chassis comprising a lattice-like structure including side and end walls at the periphery thereof and at least one intermediate wall extending therebetween, the walls serving as partitions that define open-ended cubicles within which substantially all of the components are mounted, the height of the side, end, and intermediate walls being such that a substantial portion of each component mounted within the confines of the wall is contained within the volume defined by the upper and lower surfaces of the walls, and the cover member, base member, and certain of the components being fastened to the walls.

3,941,952

TELEPHONE EXCHANGE SYSTEM EMPLOYING MEANS CAPABLE OF BREAKING A CONNECTION BETWEEN A TERMINAL UNIT AND A SWITCH FRAME USING MECHANICAL LATCHING TYPE CROSSBAR SWITCHES

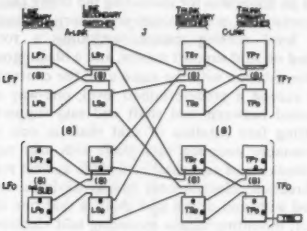
Hiromi Moriyama, Fujisawa; Motosuke Kuwabara, Yokohama; Katsuyuki Jin, Kawasaki, and Tadao Tsuruda, Yokohama, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 21, 1973, Ser. No. 427,307

Claims priority, application Japan, Dec. 25, 1972, 47-129260

Int. Cl.² H04Q 3/00

U.S. Cl. 179—18 GE 2 Claims



1. In a telephone exchange system including a switch frame having a plurality of input terminals and a plurality of output terminals, between which terminals selectively interconnectable stage of mechanical latching type crossbar switches are coupled;

an incoming terminal unit having its input coupled to an external end device and its output coupled to one of said input terminals of said switch frame;

an outgoing terminal unit having its input coupled to one of said output terminals of said switch frame; and

a common control for controlling the establishment of a channel through the crossbar switches from the input to output terminals thereof and for setting up a call connection circuit from the external end device, through the incoming terminal unit and the channel, to said outgoing terminal unit;

the improvement wherein said outgoing terminal unit comprises:

first disconnecting means, responsive to the opening of the call connection circuit at the external end device, for electrically disconnecting the input of said outgoing terminal unit with the output terminal of said switch frame; and

said incoming terminal unit comprises

second disconnecting means, responsive to the disconnecting of the call connection at the outgoing terminal unit by the first disconnecting means, for electrically disconnecting the output of said incoming terminal unit with the input terminal of said switch frame.

3,941,953

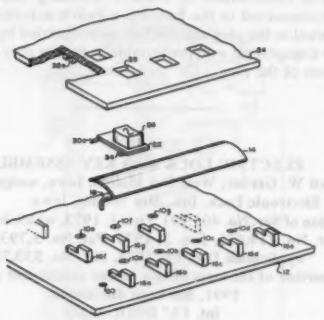
KEYBOARD HAVING SWITCHES WITH TACTILE FEEDBACK

William W. Misson, Santa Rosa; Clarence K. Studley; William J. West, both of Los Altos, and Edward T. Liljenwall, Sunnyvale, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 23, 1971, Ser. No. 173,754

Int. Cl.² H01H 13/26, 1/06

U.S. Cl. 200—5 R 13 Claims



1. A switching apparatus comprising:

a rigid substrate;

first conductive means comprising at least one conductor supported on the substrate;

second conductive means comprising at least one conductive strip having at least a portion thereof arched about an axis substantially parallel to the surface of the substrate and supported over the first conductive means to form one or more intersections of the arched portion of the second conductive means and the first conductive means; and

actuator means supported over the second conductive means comprising an actuator for each intersection of the first and second conductive means for deflecting the arched portion of the second conductive means into contact with the first conductive means and for causing the resilience of the arched portion of the second conductive means to change abruptly in response to deflection by an actuator, whereby tactile feedback is provided to a user actuating an actuator.

3,941,954

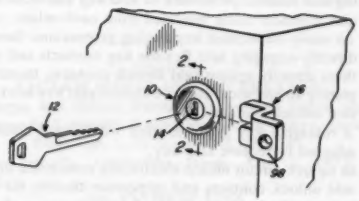
MAGNETIC CAPTIVE KEY SWITCH LOCK

Robert E. Wintringham, 3049 Calle Rosales, Santa Barbara, Calif. 93105

Filed Sept. 10, 1974, Ser. No. 504,760

Int. Cl.² H01H 27/08; E05B 47/00, 35/08

U.S. Cl. 200—44 9 Claims



1. In combination with a lock mechanism having a tubular housing and a plug angularly displaceable by an authorized key from a release position in which said key is received in a

keyway formed in the plug to a captive position in which the key cannot be withdrawn from the keyway, means for releasably preventing withdrawl of said key from the lock mechanism, comprising latch means automatically activated in response to positioning of the plug in the captive position for preventing angular displacement of the plug by said key to the release position, and release means operatively positioned in non-rotative relation on the key in the captive position of the plug for magnetically releasing the latch means to permit displacement of the plug to the release position.

7. The combination of claim 1 including fixed terminal means connected to the housing, a switch actuator drivingly connected to the plug and contact means carried by the actuator for engagement with the terminal means in only one of said positions of the plug.

3,941,955
ELECTRIC LOCK AND KEY ASSEMBLY

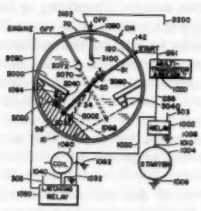
Richard W. Gerber, West Des Moines, Iowa, assignor to Gerber Electronic Lock, Inc., Des Moines, Iowa

Division of Ser. No. 401,991, Oct. 1, 1973, which is a division of Ser. No. 214,675, Jan. 3, 1972, Pat. No. 3,793,500. This application Dec. 17, 1974, Ser. No. 533,720

The portion of the term of this patent subsequent to Feb. 19, 1991, has been disclaimed.

Int. Cl.² H01H *47/00*

U.S. Cl. 200—44 **6 Claims**



1. An electric lock comprising:

a. a lock housing;

b. a set of flexible electrical, key contacts mounted in said housing, said key contacts being insulated from each other;

c. a set of electrical unlock contacts, mounted in said housing and located proximate to said key contacts, said unlock contacts being insulated from each other;

d. an easily duplicated key having protrusions thereon for directly engaging said flexible key contacts and pressing them directly against said unlock contacts, thereby completing an electrical circuit between said key contacts and said unlock contacts;

e. a rotatable key guide located within said housing and adapted to receive said key;

f. an unlock circuit means electrically connected to each of said unlock contacts and responsive thereto for producing an unlock electrical signal upon insertion of said key into said key guide so as to directly engage each of said flexible key contacts and upon rotation of said key guide to press said key contacts directly against said unlock contacts.

3,941,956
APPARATUS FOR INDICATING THE FILLING LEVEL OF SILOS AND THE LIKE

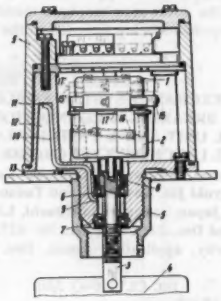
Heinz Delin, Wedel, Holstein, and Horst Rusbuldt, Hamburg, both of Germany, assignors to H. Maihak AG, Hamburg, Germany

Filed Nov. 26, 1973, Ser. No. 418,817

Claims priority, application Germany, Nov. 28, 1972, 2258177

Int. Cl.² H01H *35/00*; G08B *21/00*

U.S. Cl. 200—61.2 **3 Claims**



1. In an apparatus for indicating the filling level of silos and like containers, a combination comprising support means; filling level sensing means, including a rotatable shaft mounted on said support means, and a blade mounted on said shaft for rotation with the same until the contents of the container exceed a predetermined level; one-way clutch means interposed between said shaft and said support means and permitting free rotation of said shaft in one direction but non-rotatably coupling said shaft with said support means upon blocking of said shaft and blade against rotation in said one direction; electromotor means having a rotor which is coupled with and drives said shaft in said one direction, and a stator; mounting means mounting said electromotor means on said support means and permitting limited turning of said stator relative to said support means between a normal position which the stator assumes when said shaft rotates in said one direction, and an angularly displaced position which the stator assumes in response to the development of reaction forces resulting from blocking of said shaft and blade against rotation in said one direction; and signal-generating means for generating a signal in response to said stator assuming said displaced position.

3,941,957
HIGH CURRENT HIGH VOLTAGE SWITCH STRUCTURE WITH CONDUCTIVE PISTON

Ted N. Tilman, 3538 Telegraph Drive, San Jose, Calif. 32951

Filed May 9, 1974, Ser. No. 468,564

Int. Cl.² H01H *35/38*

U.S. Cl. 200—82 R **23 Claims**

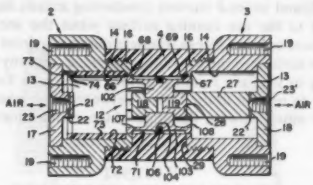
1. An electric switch structure comprising:

a. a pair of axially aligned and spaced terminal connection members having fixed cylindrical contact surfaces thereon arranged in axially spaced relationship;

b. a cylindrical dielectric sleeve disposed between said spaced terminal connection members, the inner peripheral surface of said sleeve being coextensive with the inner peripheral surface of said fixed cylindrical contact surfaces on said terminal connection members;

c. a movable contact disposed within the envelope formed by said terminal connection members and said dielectric sleeve and reciprocable between first and second positions to make or break an electric circuit through said

terminal connection members, said movable contact including a pair of oppositely extending cylindrical skirt portions, each skirt portion comprising a multiplicity of resilient contact fingers arranged in a circular array and guided in its movement by the interior periphery of said



fixed contact surfaces and said intermediate dielectric sleeve; and

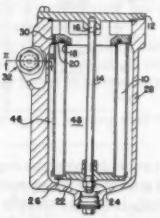
d. said movable contact constituting an electrically conductive piston which makes electrical contact with said spaced terminal connection members through substantially 360°

3,941,958

FILTER BYPASS INDICATOR

Edward E. Flesburg, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 9, 1974, Ser. No. 496,042
Int. Cl.² H01H *35/38*
U.S. Cl. 200—82 R **4 Claims**



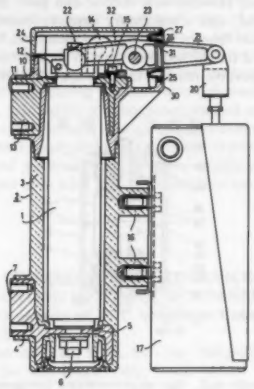
1. The combination comprising housing means having terminal means associated therewith and a filter element, and bypass means associated with said housing means and comprising a piston movable in first and second directions relative to said housing means within a bore defined by the housing means, and resilient means for resiliently urging the piston in the first direction, said piston being movable in said second direction against the resilience of the resilient means, the piston being movable in said first direction to a position directing fluid through said filter element, and movable in said second direction upon buildup of fluid pressure thereon due to blocking of fluid flow in the filter element, against the resilience of the resilient means, to a position wherein the fluid flow may bypass the filter element, and means for maintaining an electrically conductive state between the piston and the terminal means upon an initial degree of movement of the piston in its second direction against the resilience of the resilient means due to a degree of fluid pressure buildup on said piston, and for breaking said electrically conductive state between said piston and said terminal means upon further movement of the piston in the second direction, due to further fluid pressure buildup on said piston.

3,941,959

VACUUM SWITCHING APPARATUS WITH A DRIVE UNIT AT GROUND POTENTIAL

Werner Kohler, Bentfeld, Holstein, and Norbert Steinemer, Berlin, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Apr. 25, 1974, Ser. No. 464,242
Int. Cl.² H01H *33/66*
U.S. Cl. 200—144 B **3 Claims**



1. In a vacuum switch apparatus including a switching vessel operable at and including parts at high potential, and a drive unit at ground potential equipped with a drive assembly for actuating the switch of the switching vessel, the drive assembly comprising:

an actuating lever made of insulating material extending between the drive unit and the switching vessel;

an electrically conductive bearing pin for pivotally supporting said lever, said electrically conductive bearing pin being mounted in said apparatus between said switching vessel and drive unit and being at a potential intermediate said high potential and said ground potential;

a cover mounted on said switching vessel to define an enclosed space with respect to said parts of the switching vessel, said lever being connected to said switching vessel at one of said parts thereof, said electrically conductive bearing pin and the portion of said lever connected to the switching vessel being contained within said cover;

a housing for accommodating the switching vessel therein, said electrically conductive bearing pin being mounted in said housing, and said cover being a removable part of the housing, said housing having an opening formed therein for accommodating the passage therethrough of the portion of said lever extending to the drive unit; and

a membrane-like insulating and sealing member arranged at said opening in surrounding relation to said lever, whereby said space in said cover is maintained as a dust-free, dry zone.

3,941,960

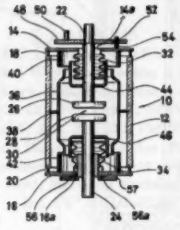
VACUUM POWER CIRCUIT BREAKER

Eiji Umeya, and Hifumi Yanagisawa, both of Tokyo, Japan, assignors to Kabushiki Kaisha Meidensha, Tokyo, Japan

Filed Apr. 1, 1974, Ser. No. 457,137
Claims priority, application Japan, Apr. 2, 1973, 48-39911[U]
Int. Cl.² H01H *33/66*
U.S. Cl. 200—144 B **6 Claims**

1. In a vacuum power circuit breaker including a generally cylindrical vacuum bulb having first and second end plates formed with respective openings which are substantially

aligned with each other, first and second electrode rods axially projecting into said vacuum bulb respectively through said openings in the first and second end plates and carrying respective electrical contact elements at their leading ends, said second electrode rod being axially movable toward and away from said first electrode rod for moving the contact element on the second electrode rod into and out of engagement with the contact element on the first electrode rod, first and second flexible connecting members respectively providing sealed connections between said first end plate and said first electrode rod and between said second end plate and said second electrode rod, and a stationary support member positioned over the outer face of said first end plate and having said first electrode rod fixedly secured thereto so that said vacuum bulb is entirely movable relative to said support member and to said



first electrode rod, the improvement comprising means for preventing said vacuum bulb from rotating about its axis relative to said support member while allowing the vacuum bulb to axially move relative to the support plate, said means comprising a portion of said support member, said portion being formed with at least one aperture located over the outer face of said first end plate of said vacuum bulb, and at least one rigid, elongated member fixedly mounted on said first end plate and extending from the outer face of said first end plate parallel with the axis of said vacuum bulb, said elongated member being axially movable through said aperture so that said first end plate is allowed to move relative to said support member in axial direction of said vacuum bulb while being prevented from rotating relative to said support plate about the axis of said vacuum bulb.

3,941,961

CONTACT ARRANGEMENT FOR A VACUUM SWITCH

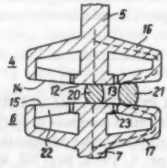
Horst Kopplin, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Oct. 3, 1974, Ser. No. 511,712

Claims priority, application Germany, Oct. 18, 1973, 2352540

Int. Cl.² H01H *33/66*

U.S. Cl. 200—144 B **7 Claims**



1. A contact arrangement for a vacuum switch comprising contact members movable relative to each other for electrically opening and closing the vacuum switch, each of the contact members including a carrier and a contact piece mounted on said carrier, each of the contact pieces defining a centrally disposed contact surface, the contact surfaces of the contact pieces being mutually adjacent so as to be in mutual contact when the switch is closed and to conjointly define a gap when the vacuum switch is opened; each of the contact pieces having an arc running surface disposed in surrounding relation to the contact surface thereof; and, each of the contact pieces further including first current conducting means for directing current to the central contact surface thereof, and second current conducting means for supplying current to the arc running surface when the arc drawn between said contact pieces wanders outwardly from the central contact surface to the arc running surface whereby the current flowing to said arc running surface develops a force to urge the arc to remain in the region between the contact pieces as the arc moves toward the edge of the contact piece.

3,941,962

GAS BLAST CIRCUIT BREAKER

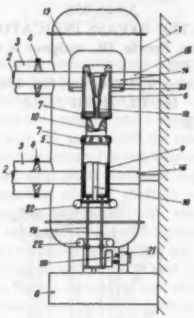
Richard Thaler, Unterentfelden, Switzerland, assignor to Sprecher & Schuh AG, Aarau, Switzerland

Filed Nov. 29, 1973, Ser. No. 420,091

Claims priority, application Switzerland, Jan. 12, 1973, 420/73; Feb. 2, 1973, 1548/73; Feb. 2, 1973, 1549/73

Int. Cl.² H01H *33/70*

U.S. Cl. 200—148 A **12 Claims**



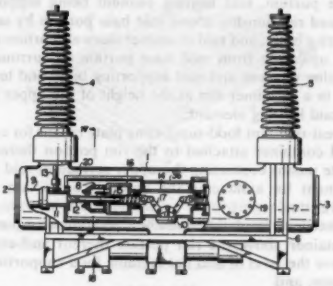
1. A gas blast circuit breaker having a stationary set of contact means and a movable set of contact means, each said set comprising radially inner and radially outer contact means, the radially inner contact means of the two sets being arranged to interengage and the radially outer contact means of the two sets being arranged to interengage; actuating means for moving the movable set of contact means, the radially outer contact means being arranged to be disengaged before the radially inner contact means disengage; and a blast nozzle of the insulating material, arranged to move with the movable contacts and having inlet means for receiving a pressurized quenching gas from a gas pressure chamber, which nozzle has a narrowest portion thereof disposed downstream with respect to the direction of the quenching gas blast of the end of the radially inner movable contact means and disposed between the radially inner and radially outer movable contact means, said blast nozzle comprising upstream of its said narrowest portion a radially inner first annular longitudinal quenching gas duct encircling the radially inner movable contact means whereby quenching gas in said first duct will be directly impinge on and flow along the said inner movable contact means, and a coaxially outer second annular longitudinal quenching gas duct, merging with said first annular quenching gas duct in the range of the free end of the radially inner movable contact means, further means being provided at the inlet end of said first annular longitudinal duct for preventing direct back flow from said first annular duct into said gas pressure chamber.

3,941,963

CIRCUIT BREAKER

Kouji Sasaki; Seizo Nakano, and Tohru Tsubaki, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed May 14, 1974, Ser. No. 469,761
Claims priority, application Japan, May 21, 1973, 48-57078
Int. Cl.[2] H01H 33/88
U.S. Cl. 200—148 A 6 Claims



1. A circuit breaker comprising:

a tank of metal material filled with an arc extinguishing gas of a single pressure;

at least two puffer type circuit breaking units disposed within said tank in series relation with each other and extending horizontally along the same axis, each of said breaking units including gas compressing means for compressing said arc extinguishing gas as soon as the breaking operation takes place, a nozzle of insulating material for guiding the compressed arc extinguishing gas, and a partible contact assembly detachably mounted to a main circuit conductor disposed within said tank;

actuating means for actuating said gas compressing means and said contact assembly;

an opening bored in the side wall of said tank at a position opposite to one of said contact assemblies, said opening having a diameter larger than the outer dimension of said nozzle; and

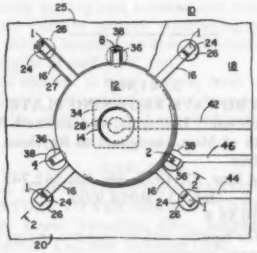
a detachable cover tightly closing said opening.

3,941,964

PUSH-BUTTON TYPE BINARY SWITCH DEVICE

Alan C. Yoder, Fort Wayne, Ind., assignor to Bowmar Instrument Corporation, Fort Wayne, Ind.

Filed Dec. 9, 1974, Ser. No. 530,744
Int. Cl.[2] H01H 3/12
U.S. Cl. 200—159 A 12 Claims



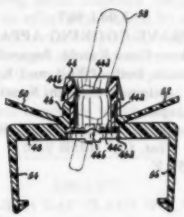
1. A push-button type switch device for use in generating binary coded signals comprising an insulative board having flat opposite surfaces, and an overcenter, snap-acting diaphragm switch member movable between a first inactive position and a second overcenter operative position in response to application of a predetermined operating force thereon, said member having a centrally disposed common contact area, said switch member having a plurality of radially spaced contact elements formed on the periphery thereof, at least some of said contact elements respectively engaging first terminal pads on one surface of said board and normally supporting said member thereon in said first position, a common terminal on said one surface of said board and having an external conductor connected thereto, said common terminal being in registry with said common contact area and spaced therefrom in said first position, at least one of said contact elements having a portion respectively in registry with and spaced from another terminal pad on said one surface of said board in said first position of said member, at least one preselected terminal pad having another external conductor connected thereto, said member being proportioned and arranged so that said contact element portion engages said other terminal pad in a third position of said member intermediate said first and second positions and prior to engagement of said common contact area with said common terminal.

3,941,965

SNAP-IN BUSHING AND FRAME DEVICES FOR MOUNTING IN A HOLE IN A PANEL

Earl T. Piber, Oconomowoc, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Aug. 26, 1974, Ser. No. 500,362
Int. Cl.[2] H01H 9/02; G12B 9/10
U.S. Cl. 200—296 14 Claims



1. A snap-in mounting means for an electric device adapting the device to be mounted from the rear through a hole in a mounting panel so that a part of the device is accessible at the front of the panel comprising:

a bushing having a bore therethrough including means for retaining the accessible part of the electric device therein;

a circular locking collar on said bushing flaring from the top thereof out toward the electric device to a point spaced from the device a distance greater than the thickness of the mounting panel;

clearance space on the wall of said bushing beneath said locking collar allowing the latter to be squeezed thereinto when said bushing is pressed into the hole in the panel whereafter said locking collar will inherently flare out again to abut the front of the panel and lock the device to the panel;

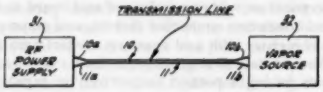
and the part of said bushing below said clearance space being large enough to be closely surrounded by the edge of the panel at the hole.

3,941,966

RF POWER TRANSMISSION LINE

Douglas S. Schatz, Santa Clara, Calif., assignor to Applied Materials, Inc., Santa Clara, Calif.

Filed May 22, 1974, Ser. No. 472,180
Int. Cl.[2] H05B 7/11; H01B 11/12
U.S. Cl. 219—10.49 2 Claims



2. In a transmission line for delivering power from a source to a load:

A. a first group of longitudinally extending flexible wire conductors disposed side-by-side and connected electrically together at their ends to form a generally flat supply line for connection between the source and load, said conductors having individual insulative jackets encasing the same, said jackets being bonded together along their lateral edges to form a unitary structure;

B. a second group of longitudinally extending flexible wire conductors disposed side-by-side and connected electrically together at their ends to form a generally flat return line for connection between the source and load, said conductors having individual insulative jackets encasing the same, said jackets being bonded together along their lateral edges to form a unitary structure; and

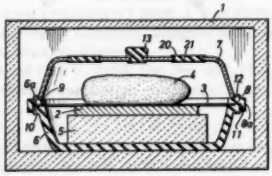
C. flexible sheath means encasing the supply and return lines and holding said lines in close proximity to each other, said sheath means permitting longitudinal movement of the lines relative to each other and to the sheath means.

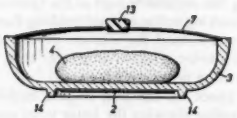
3,941,967

MICROWAVE COOKING APPARATUS

Momoki Sumi, Tokyo; Goro Kanda, Sagamihara; Norio Iriguchi; Susumu Isohata, both of Fuji, and Kyoichi Sasaki, Seijyo, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Sept. 28, 1973, Ser. No. 401,719
Int. Cl.[2] H05B 9/06
U.S. Cl. 219—10.55 E 3 Claims





1. An integrated cooking vessel adapted to provide controlled thermal and microwave cooking of food contained therein upon irradiation with microwave radiation, which comprises:

a microwave-absorbing heating element having an upper surface and a lower surface, and capable of being heated rapidly to high temperatures upon irradiation with microwave radiation;

a heat-insulating and microwave-transparent body located beneath the lower surface of said heating element for supporting said element and limiting the downward conduction of heat therefrom;

a heat-insulating and microwave-transparent container having a lower base portion and a sidewall portion, said heat-insulating supporting body being positioned on said base portion, said heating element being supported in spaced relationship above said base portion by said supporting body, and said container sidewall portion extending upwardly from said base portion to surround said heating element and said supporting body and terminating in a container rim at the height of the upper surface of said heating element;

flat, heat-resistant food-supporting plate means for covering said container attached to the rim portion thereof, said plate means contacting the upper surface of said heating element for enhancing the upward conduction of heat therefrom;

an electrical insulating member positioned around said container above the rim portion thereof and extending above the level of said flat metallic food-supporting plate means; and

a container cover, removably positioned on said electrical insulating member in spaced relationship above said metallic food-supporting plate means, said cover having selected microwave-transparent portions and selected microwave-opaque portions to permit a desired degree of microwave radiation to reach the food being cooked and to establish a desired relationship between the degree of thermal cooking and microwave cooking thereof.

3. An integrated cooking vessel adapted to provide controlled thermal and microwave cooking of food contained therein upon irradiation with microwave radiation, which comprises:

a heat-insulating and microwave-transparent container having a base portion with an upper surface and a lower surface and a sidewall portion, the upper surface of said container base having a substantially flat portion for supporting said food to be cooked;

a microwave-absorbing heating element, capable of being heated rapidly to high temperatures upon irradiation with microwave radiation and affixed to the lower surface of said base portion;

means for supporting said container disposed on the lower surface of said base portion; and

a container cover, removably positioned on said container and having selected microwave-transparent portions and selected microwave-opaque portions to permit a desired degree of microwave radiation to reach the food being cooked and to establish a desired relationship between the degree of thermal cooking and microwave cooking thereof.

3,941,968

MICROWAVE BROWNING PLATE

George H. MacMaster, Lexington, and Kenneth W. Dudley, Sudbury, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Mar. 27, 1975, Ser. No. 562,745
Int. Cl.[2] H05B 9/06
U.S. Cl. 219—10.55 E 2 Claims

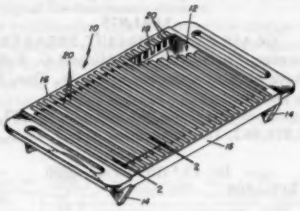
1. A utensil for heating with microwave energy at a predetermined frequency comprising:

a plurality of members of a low dielectric constant material having four parallel sides;

siad dielectric members having a height of approximately one-quarter of a guided wavelength of energy at said frequency propagated within the dielectric members;

a coating of a conductive material on three sides of said members;

means for supporting said members in a parallel array with intervening spaces and the uncoated sides exposed to receive a load to be heated; and



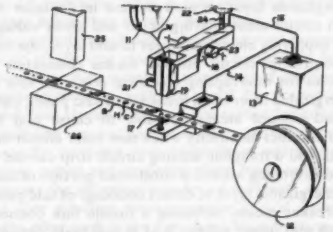
said uncoated sides providing a fringing electric field in close proximity to the load when microwave energy is applied.

3,941,969

APPARATUS AND PROCESS FOR APPLYING CONTACT DOTS

Stanton Brenneman LeFever, Lancaster, and Robert Michael Matrisian, New Cumberland, both of Pa., assignors to E. I. Du Pont de Nemours and Co., Wilmington, Del.

Filed Aug. 9, 1973, Ser. No. 387,033
Int. Cl.² B23K 11/22
U.S. Cl. 219—68 9 Claims



1. A process for attaching a metal element to metal member, comprising the steps of:

engaging an end portion of said metal element with said metal member,

welding said end portion to said metal member by passing an electrical current through said element and said member thereby heating said element and removing the heat from said element thereby establishing a difference in temper along a boundary within said element contiguous to the region of said weld, and

pulling said element to break it away from said member in the region of said weld along said boundary leaving said end portion of said element attached to said member.

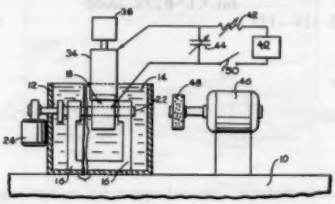
3,941,970

FEED ROLL AND METHOD OF IMPARTING A ROUGH TEXTURE TO THE SURFACE THEREOF

Arthur Larry Grow, Versailles, Ohio, assignor to Precision Tool & Machine Co., New Bremen, Ohio

Filed May 13, 1974, Ser. No. 469,420
Int. Cl.² B23K 9/16
U.S. Cl. 219—69 R 2 Claims

1. A feed roll formed of hardened steel, especially feeding strip stock into a machine tool, such as a press, and comprising, a steel body having a central axis of rotation and a peripheral surface concentric with said axis, wherein the improvement comprises EDM formed pits in said peripheral surface and distributed uniformly thereover in both the axial and circumferential directions, said EDM formed pits being on the



order of about 250 microinches RMS, and said EDM formed pits imparting a roughness to said peripheral surface to enhance the gripping of the strip stock by said peripheral surface as the strip stock is intermittently fed to the press.

3,941,971

RESISTANCE BRAZING OF SOLID COPPER PARTS TO STRANDED COPPER PARTS WITH PHOS-SILVER

Frank W. James, Jr., Doctors Inlet, Fla., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 27, 1974, Ser. No. 527,928
Int. Cl.² B23K 1/04
U.S. Cl. 219—85 2 Claims

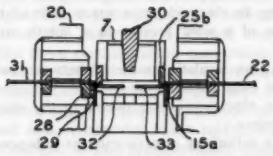
1. In the method of brazing solid copper to stranded copper by means of a joining compound containing copper, silver and phosphorus which method includes clamping under predetermined force the members to be joined in predetermined relation with the joining metal disposed therebetween and in which the joint to be effected is heated by resistance heating including the utilization of a molybdenum tip on the electrode adjacent the solid copper, the improvement comprising forming at least the tip of the opposite electrode which is in contact with the stranded copper from a composite consisting essentially of tungsten and copper in which the tungsten to copper ratio is about 3:1 on a weight percent basis.

3,941,972

SHEAR IN GAP FLASH WELDER

Charles A. Toma, Warren, Ohio, assignor to The Taylor-Winfield Corporation, Warren, Ohio

Filed Jan. 20, 1975, Ser. No. 542,308
Int. Cl.² B23K 11/04
U.S. Cl. 219—97 8 Claims

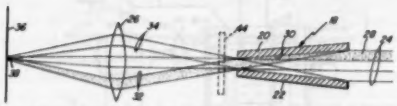


4. A flash welding machine comprising two pairs of current-carrying welding electrodes, a double blade guillotine type shear, means for moving said welding electrodes relatively apart to form a gap therebetween, means for moving said shear from an exterior position into said gap, and means for clamping both lower blades of said shear between both lower welding electrodes of said pairs to provide firm support therefor prior to shearing.

3,941,973
LASER MATERIAL REMOVAL APPARATUS

Clarence F. Luck, Jr., Waltham, and Colin Bowness, Weston, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed June 26, 1974, Ser. No. 483,338
Int. Cl.² B23K 26/00
U.S. Cl. 219—121 L 7 Claims

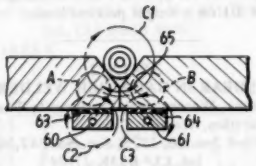


1. Laser material removal apparatus comprising a laser adapted to produce a beam of radiation having a substantially circular cross-sectional shape and to dissect said beam toward an image plane along an optical asis, and means for forming at said plane a substantially rectangular image of said beam having a fixed predetermined width and a controllable length, said means comprising an optical system located on said axis and including a pair of spaced flat reflecting means disposed on opposite sides of said axis and angled to provide at one end an entrance aperture for the beam and an exit aperture at the opposite end which is smaller than said entrance aperture for superimposing opposite side portions of said beam onto a central portion thereof whereby the beam at the exit aperture is compressed in one direction without being compressed in the perpendicular direction, and slit means adjacent said exit aperture for controlling the size of the beam in said perpendicular direction.

3,941,974
ARC WELDING PROCESS

Motomi Kano, Fujisawa; Hitoshi Shioyama, Kamakura; Yasuhito Takeuti, Fujisawa, and Masahiro Niikawa, Kamakura, all of Japan, assignors to Kobe Steel Ltd., Kobe, Japan

Filed May 18, 1973, Ser. No. 361,585
Claims priority, application Japan, May 20, 1972, 47-50013
Int. Cl.² B23K 9/08
U.S. Cl. 219—137 R 2 Claims

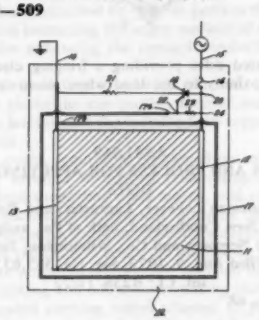


1. An arc welding process, comprising the steps of:
positioning an electrode in a space defined by the inner surfaces of a weld groove in a length wise direction thereof,
interposing an insulating material between said electrode and said inner surfaces, and
placing an electromagnetic means in the vicinity of said weld groove,
applying a subsidiary electric current independent of said welding current to said electromagnetic means,
wherein said electromagnetic means comprises a first subsidiary backing member placed either above or beneath said weld groove and a second subsidiary backing member placed at a position opposite said first backing member with respect to said weld groove, said subsidiary electric current comprises two currents which flow in said first and second backing member, respectively and wherein a current flow through said first subsidiary backing member is in a direction opposite to a current flowing through said second subsidiary backing member and wherein said welding current comprises an alternating current and said subsidiary currents comprise direct currents,
for controlling the path of magnetic flux caused by a welding current to be applied to said electrode and members to be welded whereby the welding arc is directed towards a predetermined region in said groove.

3,941,975
GLASS PANEL CIRCUIT BREAKER

Irvin Newman, Cherry Hill, and Michael G. Kelly, Turnersville, both of N.J., assignors to Ira W. Fine, Pennsauken, N.J., a part interest

Continuation-in-part of Ser. No. 446,429, Feb. 27, 1974, Pat. No. 3,876,862. This application Apr. 7, 1975, Ser. No. 565,634
Int. Cl.² H05B 1/02, 3/06
U.S. Cl. 219—509 4 Claims



1. In combination with a frangible panel having an electrically-energizable layer secured thereto in coplanar relation and main circuit means having upper and lower voltage level leads for supplying electrical power to said layer, the improvement comprising: circuit breaker means connected in said main circuit for interrupting electrical power to said electrically-energizable layer upon breakage of said panel, electrically-actuated control means operable to cause said breaker means to conduct electricity when said main circuit means is energized, and a frangible sensing circuit strip carried by said panel and extending around a substantial portion of said electrically-energizable layer to detect breakage of said panel, said circuit breaker means including a fusible link connected in series with said upper voltage lead in said main circuit means and in series relation with said electrically-energizable layer, said control means including a solid-state device connected in said main circuit means in parallel relation with said electrically-energizable layer and in series with said fusible link, said solid-state device having gate means operable to render said solid state control device selectively conductive and non-conductive, and means electrically connecting one end of said sensing circuit strip to said gate means and the upper voltage lead and means electrically connecting the other end of said sensing circuit strip to the lower voltage lead in said main circuit means to maintain said solid-state control device non-conductive so long as said sensing circuit strip is continuous and to cause said solid-state control device to conduct when continuity of said sensing circuit strip is interrupted, whereby the solid state control device shunts the electrically-energizable layer and blows the fusible link to interrupt power to the electrically-energizable layer.

3,941,976
VOTE RECORDING

M. Susan Huhn, 38 Ridgewood Ave., Groton, Mass. 01450

Filed May 15, 1974, Ser. No. 470,156
Int. Cl.² G07C 13/00
U.S. Cl. 235—54 F 23 Claims

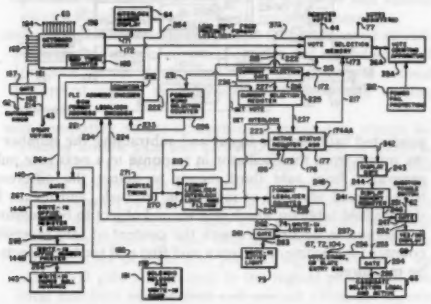
1. Voting apparatus comprising,
display means for displaying items to be voted upon and an item that is selected,

means for selecting an item to be voted upon to provide a uniquely representative digital address signal,

vote selection storage means coupled to said means for selecting,

means coupled to said means for selecting for entering a voter's choice in a location in said vote selection storage means designated by said digital address signal to provide a vote signal for temporary storage,

means for conditioning said vote selection storage means to have available a number of vote storage spaces corresponding to the maximum number of legal votes designated for the item then being voted upon and the partition said vote storage spaces by designating the beginning and end of the spaces associated with an item then being voted upon,



means for transferring each vote signal only to a previously vacant vote selection storage means vote storage space,

means for indicating when a vote selection storage means storage space then stores a vote signal,

means coupled to said vote selection storage means responsive to all the vote storage spaces partitioned for storing a particular vote signal for providing a full signal,

means responsive to said full signal for preventing additional vote signals from being accepted for counting,

accumulating means coupled to said vote selection storage means for receiving vote signals from said vote selection storage means and accepting them for counting,

and means for effecting transfer of said vote signals from said vote selection storage means to said accumulating means after each voter completes his selections.

3,941,977

OFF-LINE CASH DISPENSER AND BANKING SYSTEM

Robert H. Voss, Goshen; Earl M. Ward, Hamilton, and William L. Spetz, Cincinnati, all of Ohio, assignors to The Mosler Safe Company, Hamilton, Ohio

Continuation of Ser. No. 285,812, Sept. 1, 1972, Pat. No. 3,845,277. This application July 29, 1974, Ser. No. 492,480

The portion of the term of this patent subsequent to Oct. 29, 1991, has been disclaimed.

Int. Cl.² G06K *5/00*; G06F *7/00*

U.S. Cl. 235—61.7 B **7 Claims**

1. An automatic banking system for serving a plurality of users comprising:

a card reader for reading information from a coded card;

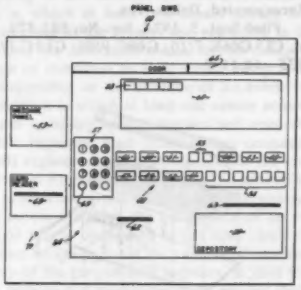
the encoded information on the card including:

a. information relating to the duration of a usage interval; and

b. information relating to a specified date bearing a predetermined relationship to said usage interval;

means for performing a specified banking transaction when the current date bears a first predetermined relationship to said specified date information and for denying said specified banking transaction when the current date bears a second predetermined relationship to said specified date information; and

means for revising said specified date information encoded on said card by an amount at least equal to said usage



interval incident to performing said specified banking transaction.

3,941,978

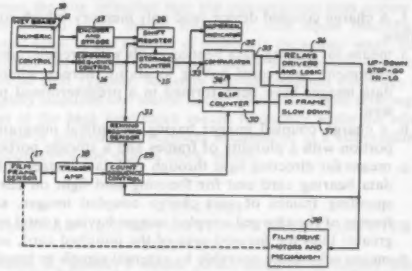
AUTOMATIC FILM SEARCHING AND RETRIEVAL SYSTEM

James E. Huston, Des Plaines, and Robert W. Murre, Chicago, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed May 8, 1974, Ser. No. 468,109

Int. Cl.² G03B *23/12*; G06G *7/28*; G06K *7/10*

U.S. Cl. 235—61.11 R **22 Claims**



16. A film drive control circuit for use in an automatic film retrieval system which uses film having a plurality of frames including document images, and has frame sensing and counting means, a programmer for preselecting a given film frame represented by a predetermined count, a comparator for comparing the counting means counts with said predetermined count, film drive means for driving the film and a command unit including a go command means for generating a go command signal, a rewind command means for generating a rewind command signal, and a rewind stop command means for generating a rewind stop command signal, the film drive control circuit comprising:

go-enable means coupled to said comparator and to said go command means for providing a first intermediate drive control signal responsive to said go command signal and said comparator when said counting means count is unequal to said predetermined count;

rewind enable means coupled to said rewind command means and to said rewind stop command means for providing a second intermediate drive control signal responsive to said rewind command signal and to the absence of said rewind stop command signal; and

drive control means coupled to said go-enable means and to said rewind enable means for providing said drive means with a final drive control signal responsive to either said first or second intermediate drive control signals causing said drive means to drive said film.

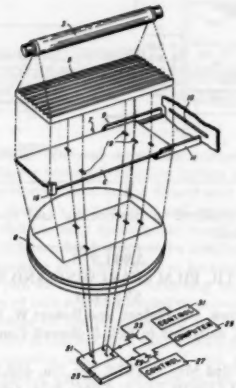
3,941,979
READ ONLY MEMORY

Harvey George Cragon, Austin, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sept. 3, 1974, Ser. No. 502,471

Int. Cl.² G06K 7/10; G08C 9/06; G11C 11/34

U.S. Cl. 235—61.11 E **3 Claims**



1. A charge coupled device read only memory, which comprises:

a. means for holding data bearing cards with predetermined alignment, said cards having locations thereon wherein data images have been formed in a predetermined pattern;

b. a charge coupled imager having an optical integration portion with a plurality of frames and a storage portion;

c. means for directing light through said data images in the data bearing card and for focusing said light on corresponding frames of said charge coupled imager, said frames of the charged coupled imager having a total area greater than the focused area of the punched card, and

d. means selectively operable by external signals to transfer data from said storage portion to an external device or to recirculate data from said data storage portion to said optical integration portion.

3,941,980
SCANNING PHOTOELECTRIC MICROSCOPE

Keiichi Okamoto; Yoshio Matsumoto, both of Yokohama, and Yasujiro Oshima, Tokyo, all of Japan, assignors to Hitachi, Ltd. and Yasujiro Oshima, both of, Japan

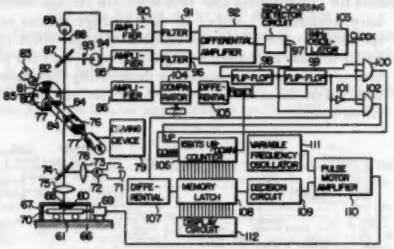
Filed Oct. 11, 1973, Ser. No. 405,269

Claims priority, application Japan, Oct. 13, 1972, 47-101874

Int. Cl.² G01B 11/26

U.S. Cl. 235—92 GC **18 Claims**

1. A scanning photoelectric microscope adapted for use in measuring indication intervals of an object to be measured in terms of time, comprising first means for arranging a first object to be measured which is mounted on a stationary support and a second object to be measured which is disposed on a slidable table in slightly spaced apart and superimposed relationship to form a plurality of indication intervals in association with said first and second objects to be measured, a scanning device for scanning a reflected image of the indication intervals in said first means at a predetermined cycle to effect parallel displacement of said reflected image, second means including a photoelectric element for converting the scanned and reflected image which is passed through a slit from said scanning device into a signal, third means for amplifying and shaping said signal from said second means to generate gate signals corresponding to said plurality of indication intervals, respectively, a marker device for generating a marker signal each time when said scanning device recurrently scans said reflected image of said plurality of indication intervals, a reversible counter for integrating the number of pulses from an oscillator in response to a first gate signal generated from said third means after said marker device has



generated said marker signal and subtracting the number of the pulses from the oscillator in response to a next gate pulse generated from said third means to detect the difference between said plurality of indication intervals, and means for shifting said table on which said second object to be measured is disposed in accordance with the content of said reversible counter for alignment between said first and second objects to be measured.

3,941,981
ROLL FILM MARK COUNTER

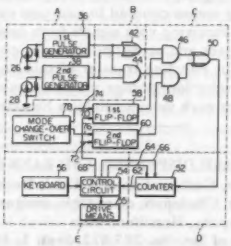
Takeshi Abe, and Yoshio Fukushima, both of Tokyo, Japan, assignors to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed Feb. 7, 1974, Ser. No. 440,517

Claims priority, application Japan, Feb. 26, 1973, 48-24363[U]

Int. Cl.² G06M 3/02; G03B 23/12

U.S. Cl. 235—92 V **9 Claims**



1. In a device for retrieving information stored on an elongated strip of material in the form of longitudinally successive frames, the elongated strip having a detectable frame mark adjacent to each frame and a detectable group mark adjacent to the first frame of each group of frames, and the device having read-out means for retrieving the information from a desired frame and drive means for moving the elongated strip through the read-out means to place the desired frame in an information retrieval position, a mark counter to count the frame marks and group marks as the elongated strip is being moved through the read-out means by the drive means and control the drive means to stop movement of the elongated strip when the desired frame has reached the information retrieval position, said mark counter comprising:

sensing means operatively arranged to sense the frame marks and group marks as the elongated strip moves through the read-out means and produce a first and a

second electrical signal each time a frame mark and a group mark respectively are sensed;

said elongated strip being a film carrying the information and the frame and group marks thereon in the form of variations in optical density and in which each frame mark is located in one margin of the film adjacent to the corresponding frame and each group mark is located in the opposite margin of the film adjacent to the corresponding frame, the mark counter also being applicable to a film in which the relative positions of the frame and group marks are reversed;

said sensing means comprising first and second sensors arranged adjacent to the one and the opposite film margins respectively to sense the one of the frame marks and group marks which is in the corresponding margin and produce the corresponding one of said first and second electrical signals respectively in response thereto;

computing means responsive to said first and second electrical signals and operative to compute the logical sum and produce of the total numbers of said first and second electrical signals respectively produce by said sensing means;

said computing means comprising a computing circuit including an OR gate and an AND gate, each of which is responsive to both of said first and second electrical signals, whereby the total number of electrical sum signals produced by said OR gate is equal to the logical sum of the total numbers of said first and second electrical signals produced by said first and second sensors, the total number of electrical product signals produced by said AND gate being equal to the logical product of the total numbers of said first and second electrical signals produced by said first and second sensors;

said computing means being further operative to stop movement of said film when a selected one of said logical sum and product is equal to a preset value corresponding to the desired frame so that the desired frame is placed in the information retrieval position; and

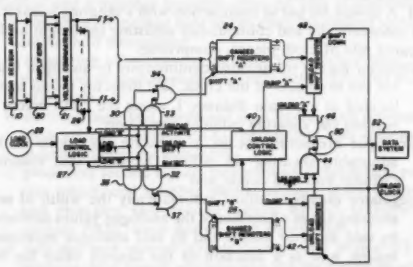
said computing means comprising means which is operative to selectively count one of said sum signals and said product signals and control said drive means to effect said stop movement of the film when the count is equal to said preset value.

3,941,982

METHOD AND APPARATUS FOR TWO-DIMENSIONAL DATA ACQUISITION

Robert George Knollenberg, Boulder Heights, and Albury John Dascher, Broomfield, both of Colo., assignors to Particle Measuring Systems, Inc., Boulder, Colo.

Filed July 22, 1974, Ser. No. 490,540
Int. Cl.² G06K 9/12
U.S. Cl. 235—92 DP **7 Claims**



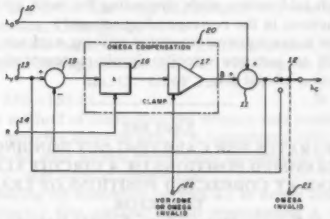
1. A system for high-speed acquisition of two-dimensional data, comprising: a linear array of sensors, at least two groups of ganged shift registers, each of the sensors being connected to at least one shift register in each group, activation means interposed between the linear array and the ganged shift registers, the activation means being responsive to a change of condition from that of each sensor being at a common state corresponding to the absence of an event occurrence to a condition in which at least one sensor senses an event to activate sampling of the sensors and recording in the ganged shift registers, the activation means further being responsive to a change of condition to each sensor being at a common state corresponding to the absence of an event occurrence from a condition in which at least one sensor senses an event to terminate sampling of the sensors and recording in the ganged shift registers, load clock means connected to the ganged shift registers to periodically sample the condition of the sensors and enter the condition of the sensors as one tier of data in at least one group of ganged shift registers when the activation means indicates the occurrence of an event, load control logic means connected to the load clock means and the activation means to count the number of tiers entered into a first group of the ganged shift registers, to shift the entry of additional tiers to the second group of ganged shift registers upon saturation of the first group of ganged shift registers, and to initiate unloading of the saturated group of ganged shift registers while the second group of ganged shift registers is being loaded, an unload clock means, an unload shift register connected to the unload portion of each group of ganged shift registers to receive in parallel a tier of data unloaded from a given group of ganged shift registers, the unload shift registers being connected to the unload clock means to serially unload the individual shift register bit by bit into a conventional data system at the unload clock means frequency, and unload control logic means to shift one tier of data from one group of ganged shift registers into the associated unload shift register, count the bits unloaded into the conventional data system at the unload clock means frequency, and, upon reaching a count equal to the number of sensors in the sensor array, shift another tier of data from the group of shift registers into the unload shift register, whereby two-dimensional data may be rapidly acquired and stored in one group of ganged shift registers at the high load clock means frequency while the other group of ganged shift registers is unloaded at a conventional frequency of the unload clock means.

3,941,983

OMEGA-VOR/DME POSITIONAL DATA COMPUTER FOR AIRCRAFT

Donald H. Baker, Phoenix, Ariz., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Jan. 27, 1975, Ser. No. 544,105
Int. Cl.² G06G 7/78
U.S. Cl. 235—150.27 **5 Claims**



1. A computer for use in aircraft for providing a computed positional data signal in response to an OMEGA positional data signal from an OMEGA system, a VOR/DME positional data signal from VOR/DME apparatus tuned to a stationary VOR/DME facility and a range signal representative of the distance of said aircraft from said VOR/DME facility, comprising:

first summing means responsive to said VOR/DME positional data signal and said computed positional data sig-

nal for providing a positional data error signal representative of the difference therebetween,

OMEGA compensation means responsive to said positional data error signal and said range signal for providing an OMEGA compensation signal with a dependance on said positional data error signal in accordance with an inverse function of said distance, and

second summing means responsive to said OMEGA positional data signal and said OMEGA compensation signal for providing said computed positional data signal in accordance with the algebraic sum thereof.

3,941,984

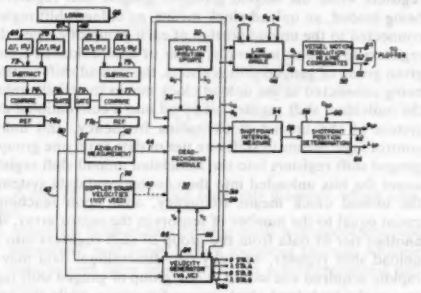
SATELLITE RADIO RANGING VELOCITY NAVIGATION

Peter Chappell, Dallas, Tex.; Burnette W. Hicks, Aberystwyth, Wales, and Gerald M. Gilbert, Plano, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed July 5, 1973, Ser. No. 376,481

Int. Cl. G06f *15/50*; G06g *7/70*, *7/78*

U.S. Cl. 235—150.27 17 Claims



1. In an integrated satellite navigation system where satellite fixes periodically establish the position of a ship plying a course within the range of a chain of radio ranging stations and wherein ship velocities must be accurately determined in the interval between satellite fixes in order to chart said course, the combination which comprises:

means for measuring difference values between successive RF signal transit times for each of a plurality of said stations,

means to store a set of functions, one for each of said stations, dependent upon said difference values for transit times related to each said station,

means to update each said set with new difference values for each said station while discarding the most aged of said functions in the corresponding set, and

a least mean squares generator utilizing said sets periodically to generate velocity signals representative of the motion of said ship.

3,941,985

APPARATUS FOR CARRYING OUT BONDING AT PROGRAMMED POSITIONS OF A CIRCUIT ELEMENT AND AT CORRECTED POSITIONS OF LEADS THEREFOR

Katsuyuki Kawase; Mutumi Sato; Kuniaki Hamada, and Seiji Hayashi, all of Tokyo, Japan, assignors to Nippon Electric Company Limited and Kaiji Denki Kabushiki Kaisha, both of Tokyo, Japan

Filed Oct. 23, 1974, Ser. No. 517,307

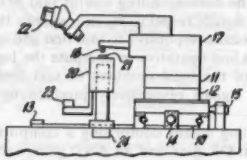
Claims priority, application Japan, Oct. 25, 1973, 48-120112; July 30, 1974, 49-87764

Int. Cl.[2] G06F *15/46*

U.S. Cl. 235—151.1 6 Claims

1. Apparatus for electrically connecting a plurality of electrodes of an electronic circuit element and a plurality of leads arranged in a predetermined geometric configuration on a lead frame, including a rotatable work stage on which the lead frame is placed with the circuit element mounted on the lead frame, a bonding tool movable with respect to said work state, driving means for driving said bonding tool relative to said work stage with reference to positions of the electrodes and leads, and azimuthal means for rotating said work stage to align the circuit element in a predetermined direction, said azimuthal means thereby producing an electric signal representative of an azimuthal error, wherein the improvement comprises:

translational means for translating the bonding tool relative to said work stage after the circuit element is aligned in the predetermined direction to place said bonding tool at



a predetermined position relative to the circuit element, the translational means thereby producing an electric signal representative of a positional error; and

the driving means including calculating means responsive to the positions of the leads and the azimuthal and positional errors for electrically calculating relative positions of the leads, and means responsive to the positions of the electrodes and the relative positions of the leads for driving the bonding tool to carry out the bonding process, said calculating means comprising first means for converting said azimuthal error into components in the directions of orthogonal rectilinear coordinate axes and second means responsive to the calculating means components, the positions of the leads, and the positional error for electrically calculating the relative positions.

3,941,986

ELECTRONIC DEVICE FOR AUTOMATICALLY AND CONTINUOUSLY ADJUSTING THE HEIGHT OF A SHEARING PILE OF TEXTILE ARTICLES HAVING A DIFFERING THICKNESS

Nicola Santucci, Schio, Italy, assignor to Nuovo Pignone S.p.A., Via Matteucci, Italy

Filed June 11, 1974, Ser. No. 478,373

Claims priority, application Italy, June 12, 1973, 25205/73

Int. Cl.[2] G06F *15/46*; D06C *23/02*

U.S. Cl. 235—151.1 5 Claims

1. A device for use in conjunction with a shearing apparatus for automatically and continuously adjusting the height of the sheared pile of cloth pieces, comprising:

detector means to measure continuously in analogue fashion the thickness of the cloth, said detector means being located at a certain distance L along the cloth before it reaches the shearing cylinder-comb unit;

analogue measuring means to measure the width of the adjustable shearing slit defined between said shearing cylinder and said comb; and

regulator means to adjust automatically the width of said shearing slit as a function of the analogue values delivered by said detector means and by said analogue measuring means, and as a function of the desired value for the height of the sheared pile;

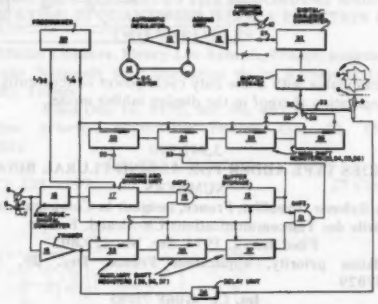
said analogue values being delivered by said detector means to said regulator means through an electronic digital device comprising:

a plurality of main shift registers, said registers being controlled by clock pulses having a period of recurrence

equal to the time interval required for the cloth to advance a length equal to the distance L divided by the number of main shift registers;

means for taking the arithmetic means of the digital thickness signals corresponding to each successive part of cloth of said length;

means for detecting the presence of a seam and for cancelling and replacing the spurious digital mean thickness signal corresponding to the part containing the seam with



the digital mean thickness signal for the part immediately preceding the part containing the seam, and for cancelling and replacing the spurious mean thickness signal for the part immediately following the part containing the seam with the signal for the part next following said part;

and means for cancelling and replacing, as soon as the seam passes the shearing cylinder-comb unit, the new digital mean thickness signal for the part containing the seam with the digital signal for the part immediately following said part following the part containing the seam.

3,941,987

METHOD AND APPARATUS FOR NUMERICAL CONTROL

Carl E. Tack, Jr., Glen Ellyn, Ill., assignor to Danly Machine Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 394,242, Sept. 4, 1973, abandoned. This application Apr. 30, 1975, Ser. No. 573,339

Int. Cl.² G06F *15/46*

U.S. Cl. 235—151.11 **50 Claims**

1. The method of controlling the velocity and changing position and a member movable along an axis in accordance with numerical command data designating the desired velocity V, said method comprising:

a. measuring off successive periods ΔT in actual time, the durations of such periods normally being ΔTN but being adjustable,

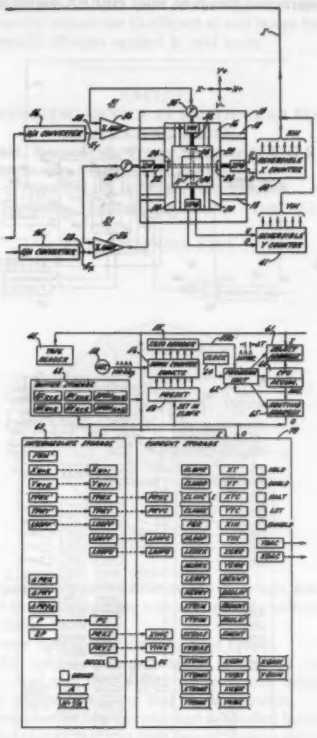
b. deriving from said command data first signals representing a velocity number PRXC designating said velocity V in units of distance per ΔTN,

c. producing second signals representing a theoretical position which said member should occupy along the axis, and changing said second signals by the represented amount PRXC once during each period ΔT,

d. utilizing said second signals during each period ΔT to produce third signals representing the then-existing error XERR between the theoretical position of said member and the actual position of said member,

e. driving said member along the axis at a velocity which is a function of both the velocity number PRXC and the error XERR as represented by said first and third signals, and

f. changing the durations of the periods ΔT measured off according to step (a) in response to predetermined condi-



tions which are dependent upon the magnitude of the error XERR as represented by said third signals.

3,941,988

METHOD AND APPARATUS FOR NUMERICAL CONTROL

John M. Hagstrom, Elmhurst, Ill., assignor to Danly Machine Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 394,241, Sept. 4, 1973, abandoned. This application Apr. 30, 1975, Ser. No. 573,340

Int. Cl.² G06F *15/46*

U.S. Cl. 235—151.11 **36 Claims**

1. The method of controlling the velocity and position of a member movable along an axis X in accordance with a block of command data signals numerically designating a desired velocity V, said method comprising:

a measuring off successive periods ΔT in actual time,

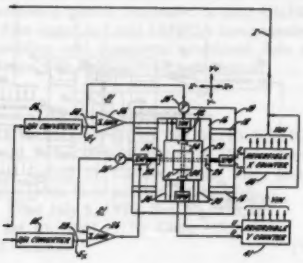
b producing first electric signals representing a velocity number PRXC proportional to the desired velocity V,

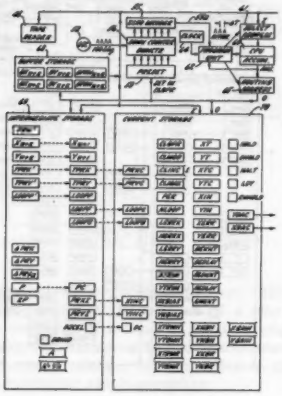
c producing second electric signals and changing them once each period ΔT to represent a periodically advancing theoretical position XTC which said member should occupy.

d producing third electric signals representing during each period ΔT the then-existing numerical error XERR between the theoretical position XTC and the actual position at which the member is located,

e applying to a velocity servo which is coupled to said member, an input signal which is proportional to the sum of

(a) a first term proportional to the number PRXC, and (b) a second term proportional to the number XERR, and f in response to said signaled error XERR exceeding a predetermined threshold value HERRX during any given





period ΔT, foregoing said changing of said second signals in step (c), omitting said step (e), and instead applying to said servo an input signal which is proportional only to the error number XERR.

3,941,989

REDUCING POWER CONSUMPTION IN CALCULATORS

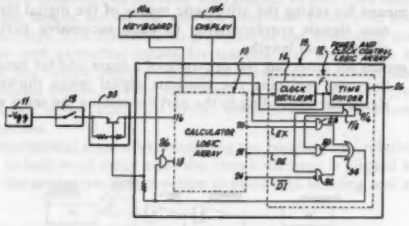
Donald L. McLaughlin, Newtown Square, and Ronald W. Streiber, Norristown, both of Pa., assignors to MOS Technology, Inc., Norristown, Pa.

Filed Dec. 13, 1974, Ser. No. 532,596

Int. Cl.² G06F 7/38, 1/04

U.S. Cl. 235—156 **15 Claims**

1. A method of reducing the power consumption rate of a calculator alternately operative in an execute mode in which new input information is processed in accordance with selected commands and is dynamically stored in the calculator, in a display mode in which selected stored information is dynamically displayed, and in a display inhibit mode in which selected stored information is maintained in dynamic storage but is not displayed, a display mode operation following an execute mode operation and continuing either until a new execute mode operation or the elapsing of a selected time interval from its start, whichever occurs first, and a display inhibit mode operation occurring in the absence of an execute or a display mode operation, comprising the steps of: supplying the calculator with high duty cycle power concurrently with the operation thereof in the execute mode; supplying the calculator with an intermediate duty cycle power concurrently with the operation thereof in the display mode; and supplying



the calculator with a low duty cycle power concurrently with the operation thereof in the display inhibit mode.

3,941,990

SERIES TYPE ADDER FOR ADDING PLURAL BINARY NUMBERS

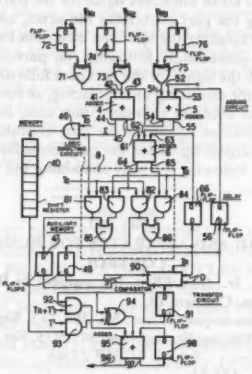
Jean Rabasse, Breuillet, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, France

Filed Jan. 2, 1974, Ser. No. 429,803

Claims priority, application France, Dec. 29, 1972, 72.47029

Int. Cl.² G06F 7/385

U.S. Cl. 235—176 **10 Claims**



1. A series type adder for adding during successive clock periods a plurality of binary numbers of any polarity received in serial form and having a sign bit as the first bit thereof by adding positive numbers and true complement of negative numbers, comprising a plurality of detection circuits for storing the respective sign bits of said binary numbers, gate means responsive to said detection circuits for forming the true complements of the negative binary numbers, adding means including a plurality of elementary series type adders for adding said positive numbers and the true complements of negative numbers, delay means for re-injecting carry-over bits and bits representing the sum of carry-over bits coupled from outputs of said adding means to inputs thereof, memory means connected to said adding means for storing the output thereof representing the addition of said binary numbers, logic directing means responsive to the outputs of one of said elementary series type adders for providing during one clock instant of an adding cycle a sum output representing the sum of the sign bits of the negative numbers and during another clock instant of said adding cycle the carry-over output of said adding means, auxiliary memory means connected to said logic directing

means for storing said sum output thereof, circuit means, included within said logic directing means, for providing the carry-over output from said logic directing means, comparator means for comparing the output of said auxiliary memory means to the output of said circuit means during a final clock instant of said adding cycle, and transfer means connected to said comparator means for enabling the contents of said memory means to be preceded by a sign bit determined by the output of said comparator means.

3,941,991

METHOD AND APPARATUS FOR RECORDING AND/OR INDICATING IN QUANTIFIED FORM A FUNCTION OF TWO VARIABLES

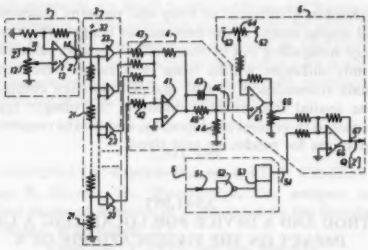
Jean-Michel Lamarre, Fleury-Les-Aubrais, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), France

Filed Oct. 18, 1973, Ser. No. 407,510

Claims priority, application France, Oct. 18, 1972, 72.36821

Int. Cl.² G06G 7/26

U.S. Cl. 235—197 27 Claims



1. A method for at least indicating a function Z of two variables X and Y comprising the steps of quantifying the value of the function Z and displaying the quantified form of the value of the function Z by projecting a luminous spot on a display area at the point of coordinates (X, Y) and providing a luminosity for the spot representative of the quantified form of the value of the function Z.

3,941,992

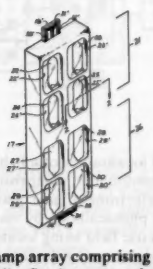
FLASH ARRAY HAVING SHIELDED SWITCHING CIRCUIT

Richard Blount, South Euclid; Paul T. Cote', Cleveland Heights, and Edward C. Zukowski, Mentor, all of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Sept. 30, 1974, Ser. No. 510,362

Int. Cl.² F21K 5/02

U.S. Cl. 240—1.3 17 Claims



1. A multiple flash lamp array comprising a plurality of flash lamps of the electrically fired type, a circuit board having circuitry on one side thereof for sequentially firing said lamps, and means for electrically connecting said lamps to said circuitry, wherein the improvement in said array comprises an electrically conductive and substantially planar shield forming part of said array and located in substantially adjacent face-to-face relation with at least part of the opposite side of said circuit board to reduce the likelihood of said lamps being fired by electrostatic charges applied to said array.

3,941,993

ILLUMINATING DEVICE IN PARTICULAR FOR AN OPERATING TABLE

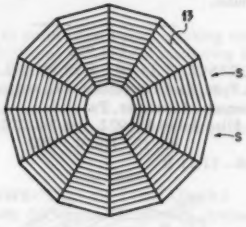
Jean Hubert, Romainville, France, assignor to C G R Alexandre, Romainville, France

Filed Oct. 9, 1974, Ser. No. 513,408

Claims priority, application France, Oct. 12, 1973, 73.36610

Int. Cl.² A61G 13/00; F21V 5/02

U.S. Cl. 240—1.4 4 Claims



1. An illuminating device intended to illuminate the operating field of an operating table with substantially uniform intensity comprising:

at least one light source emitting light beams,

a toroidal optical system, adapted to receive said light beams, and said light source being located substantially on the axis of and above said toroidal system,

a plate member having a center and so located beneath said toroidal system that said light beams, passing through said toroidal system, impinge thereon,

a prism assembly on said plate, said assembly being made of a plurality of juxtaposed straight prisms, each said prism having an axis and at least one reflective face, each said axis of each said prism being parallel to a plane, said prisms combining in a plurality of sectors, the vertices of which are substantially located in the center of said plate,

the light source, the center of said plate and the center of said operating field being substantially aligned and said light beams from said light source impinging on said operating field through said toroidal system and said prism assembly.

3,941,994

TAIL LIGHT AND FENDER

Preston L. Petty; Albert F. Harreld, both of Newberg, and Gary M. Scott, Dundee, all of Oreg., assignors to Preston L. Petty, Newberg, Oreg.

Filed Dec. 9, 1974, Ser. No. 530,858

Int. Cl.² B60Q 1/30

U.S. Cl. 240—8.1 R 5 Claims

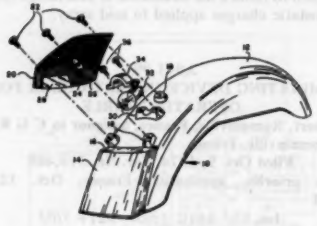
1. A vehicle fender and tail light comprising:

a fender having integral spaced mounting means extending outwardly from an outer surface of said fender;

another integral mounting means provided by said fender and extending outwardly from said outer surface of said fender;

light socket means disposed in said other mounting means including means to secure said light socket means in position therein;

lens means having a configuration conforming to said outer surface and covering said mounting means and said light socket means secured in said other socket means; and



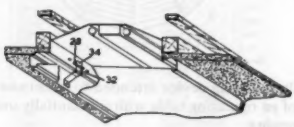
securing means engaging said lens means and said spaced mounting means securing said lens means in position on said fender.

3,941,995

FLUORESCENT LIGHT FOR MOBILE HOMES

Thomas W. Fritz, East Petersburg, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed July 14, 1972, Ser. No. 271,740
Int. Cl.² H05B 33/02
U.S. Cl. 240—51.11 R 3 Claims



1. A lighting fixture assembly which is particularly adapted to be mounted between the trusses of a roof structure and particularly adapted for use in a mobile home structure, the combination of a mobile home roof truss structure which is provided with an upper plane containing external roof sheathing and a lower plane containing internal ceiling boards, a fluorescent lighting fixture mounted within a roof cavity defined by two adjacent roof trusses and the overlying roof sheathing, said fluorescent light fixture assembly constituting a reflector structure which extends between two adjacent roof trusses and carries the fluorescent lights and their operating components, support bracket means connected to the reflector means and connecting the reflector means to the roof trusses, a lens structure mounted to overlie the fluorescent lighting fixture assembly, said support bracket means being provided with hole means into which staples are placed to mount the support bracket means in position relative to the roof trusses, and a lens clip structure is positioned adjacent to the hole means and held in position by staple means passing through the hole means and against the lens clip, said lens clip in turn holding the lens assembly in position relative to the lighting fixture assembly.

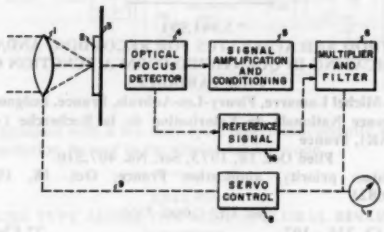
3,941,996

AUTOMATIC FOCUS APPARATUS

Norman L. Stauffer, Englewood, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 27, 1974, Ser. No. 500,869
Int. Cl.² G01J 1/20
U.S. Cl. 250—201 3 Claims

1. A combination comprising optical means for focusing an image and further means for providing an output signal representative of the direction said optical means is displaced from a predetermined position of optimum focus, said further means comprising spatial filtering means arranged to transmit spatial frequency components of said image to provide recurring fluctuating light flux patterns that are characteristic of the displacement of said optical means from said predetermined position of focus, said spatial filtering means including an interposed rotatable disc and means for rotating the latter, said disc having alternate relatively transparent and opaque radial sectors, the widths of said relatively transparent sectors



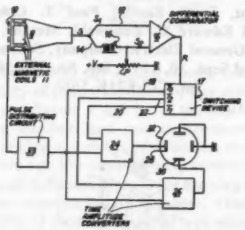
being randomly different to keep said patterns characteristic of said displacement in the presence of images which tend to produce misleading out of phase effects in said patterns, said randomly different widths lying in a range which permits adequate transmission of said spatial frequency components for the spatial frequencies present in the images typically encountered in general photography, and means responsive to said patterns for producing said signal.

3,941,997

METHOD AND A DEVICE FOR LOCALIZING A LIGHT IMPACT ON THE PHOTOCATHODE OF A PHOTOMULTIPLIER

Rene Odru, St.-Martin-d'Heres, and Jacques Vacher, Sassenage, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jan. 17, 1974, Ser. No. 434,069
Claims priority, application France, Jan. 23, 1973, 73.02250
Int. Cl.² H01J 39/12
U.S. Cl. 250—207 8 Claims

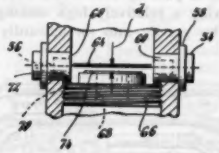


1. A method of localization of a light impact on the photocathode of a photomultiplier, comprising defocusing the beam of emitted photoelectrons of said photomultiplier, sweeping the surface of the photocathode by means of a localized electric field, said electric field being located in the vicinity of the photocathode, and measuring the time which elapses between on the one hand the instant of commencement of sweeping of the photocathode surface and on the other hand at least one change of sign of the anode signal of said photomultiplier.

3,941,998
OPTOELECTRONIC SAMPLING HEAD

Henry Merkelo, Urbana, Ill., assignor to The University of Illinois Foundation, Urbana, Ill.

Filed Feb. 26, 1974, Ser. No. 446,051
Int. Cl.² H01J 39/00, 39/12, 39/14
U.S. Cl. 250—207 17 Claims

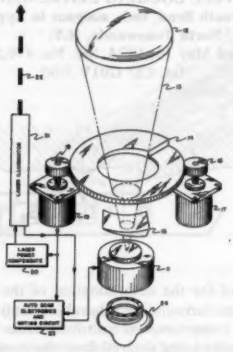


7. An optoelectronic sampling head comprising a housing having an optical path for impinging light, a photoemissive elongated strip positioned across said optical path and supported in said housing by broadband insulated electrical feedthrough elements, an insert positionable in said housing, said insert including a photoelectron ejection ground plane and an electron path, and spacer means mounted to said insert and positioned with said insert against said housing for positioning said photoelectron ejection ground plane with predetermined spatial distance from said photoemissive strip.

3,941,999
AUTOMATIC FOCUS PULSE GATED SYSTEM

Thomas E. Moyers, Jr., Woodbridge, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 1, 1975, Ser. No. 564,526
Int. Cl.² H01J 31/50
U.S. Cl. 250—213 VT 8 Claims



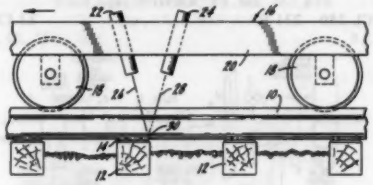
1. In an image viewing system having a pulse gated image intensifier tube, an integral source of synchronized illumination, a variable delay means for said gating pulse, means to generate said gating pulse and a manually focussed objective lens, the improvement comprising:

automatic means for continuously varying the effective focal length of said objective lens and the delay of said delay means in concert.

3,942,000
METHOD AND APPARATUS FOR POSITIONING RAILWAY MACHINES

Andrew M. Dieringer, Waterford, Wis., assignor to Rexnord, Inc., Milwaukee, Wis.

Filed Jan. 21, 1974, Ser. No. 435,155
The portion of this patent subsequent to July 17, 1990, has been disclaimed.
Int. Cl.² G01D 21/04
U.S. Cl. 250—222 R 3 Claims

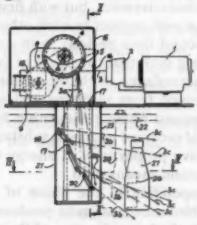


1. A method of positioning a track-working machine on a railroad track, including the steps of measuring the distance from the top of a rail to the top of a tie plate, electro-optically sensing the distance downwardly from the top of the rails, moving the machine along the track, and stopping the machine when the sensed distance equals the measured distance.

3,942,001
INSPECTION OF CONTAINERS

Bartholomew John O'Connor, Churchtown, Ireland, assignor to Talcoma Teoranta, Dublin, Ireland

Filed June 26, 1974, Ser. No. 483,350
Claims priority, application Ireland, June 27, 1973, 488/73; May 14, 1974, 1036/74
Int. Cl.² B07C 5/342
U.S. Cl. 250—223 B 54 Claims



1. Apparatus for detecting the presence of extraneous matter and/or cracks in translucent containers, said apparatus comprising:

an inspection zone;

means for rotating a translucent container within the inspection zone;

means for generating and vertically scanning a spot beam of light in the inspection zone;

a light collection apparatus in the inspection zone;

means for generating an electrical inspection signal corresponding to the amount of light passing through the translucent container and impinging on the light collection apparatus;

means for synchronously generating a predetermined electrical acceptance signal the value of said acceptance signal being a function of the vertical position of the spot beam of light relative to the container, and means for comparing said inspection signal with said predetermined electrical acceptance signal; and

means for generating a rejection signal when the intensity of light passing through the translucent container is below a

predetermined value measured by the said acceptance signal.

3,942,002

SIGNAL COMBINING CIRCUITS

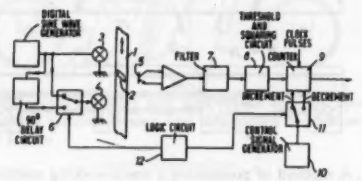
Albert Lewis Fowler, Kirkcaldy, Scotland, assignor to Hughes Microelectronics Limited, Culver City, Calif.

Filed July 11, 1974, Ser. No. 487,635

Claims priority, application United Kingdom, July 12, 1973, 33169/73

Int. Cl.² G01D 5/34

U.S. Cl. 250—231 R 11 Claims



1. An apparatus for providing an electrical signal which is indicative of the disposition of a member, said system comprising:

first and second means for radiating electromagnetic energy in accordance with respective input signals applied thereto;

third means for receiving the energy from said first and second means in variable proportions in accordance with the disposition of the member and for producing an electrical output signal indicative of the phase of said received energy;

control means for applying said input signals to said first and second means so as to cause said first and second means to concurrently radiate energy of substantially the same frequency characteristics, but with first and second phase relationships with respect to each other during respective first and second time periods, with said first phase relationship being such that the phase of said received energy varies in accordance with the relative proportions of energy received from said first and second means, and with said second phase relationship being such that the phase of said received energy is substantially independent of the relative proportions of energy received from said first and second means; and

means for responding to the phase of the output signals from said third means so as to produce a phase measurement signal which is indicative of the difference between the phase of the output signals during said first and second time periods;

whereby said phase measurement signal is indicative of the disposition of said member.

3,942,003

METHOD AND APPARATUS FOR THE IN SITU ANALYSIS OF MARINE ORE CONCRETIONS

Walter Apenberg, Karlsruhe; Georg Böhme, Leopoldshafen; Hans-Ulrich Fanger, Friedrichstal; Benno Glaser, Karlsruhe; Klaus Hain, Karlsruhe-Durlach; Jörg Hubener, Friedrichstal; Winfried Stegmaier, Leopoldshafen; Vaclav Prech, Leopoldshafen, and Jaroslav Vagner, Leopoldshafen, all of Germany, assignors to Gesellschaft fur Kernforschung m.b.H., Karlsruhe, Germany

Filed Feb. 28, 1974, Ser. No. 446,898

Claims priority, application Germany, Feb. 28, 1973, 2309974

Int. Cl.² G01V 5/00

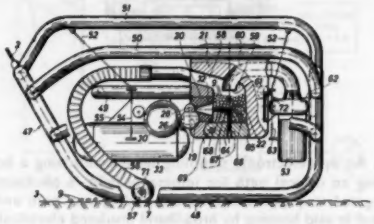
U.S. Cl. 250—255 27 Claims

1. A method for the in situ analysis of ore concretions on the sea floor, comprising the following steps:

a. guiding a means defining a suction opening along and immediately above the sea floor at a predetermined, constant height thereabove;

b. hydraulically aspirating the ore concretions off the sea floor through said suction opening by entraining the concretions in a water stream;

c. separating undesirable substances from the ore concretions by entraining the aspirated material along a substantially horizontal path by said water stream for causing material having a relatively high sinking speed to be introduced by gravity into an upwardly open sample



container positioned laterally below the horizontal path and for causing material having a relatively low sinking speed to travel past the sample container;

d. irradiating the ore concretions in the sample container with neutron radiation for inducing therein a secondary radiation characterizing the elements contained in the ore concretions;

e. measuring said secondary radiation;

f. determining the quantity of the individual elements contained in the ore concretions; and

g. determining the bulk density of ore concretions in the sample container by gamma ray absorption.

3,942,004

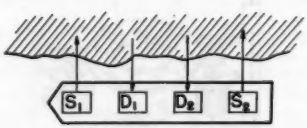
DUAL SPACED, BOREHOLE COMPENSATED NEUTRON WELL LOGGING INSTRUMENT

Paul Kehler, South Bend, Ind., assignor to Applied Inventions Corporation, North Tonawanda, N.Y.

Filed May 16, 1974, Ser. No. 470,542

Int. Cl.² G01V 5/00

U.S. Cl. 250—266 12 Claims



1. A method for the determination of the porosity of an earth formation surrounding a borehole, utilizing a well logging tool that comprises two neutron sources and two detectors, said porosity being derived from the product of the ratio and the inverse ratio of the counting rates of the first detector and of the second detector,

said ratio being derived by dividing the counting rate of said first detector by the counting rate of said second detector during a first time interval,

said inverse ratio being derived by dividing the counting rate of said second detector by the counting rate of said first detector during a second time interval,

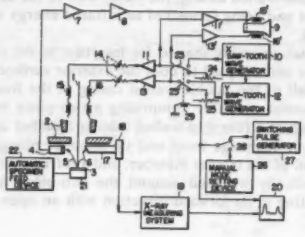
and said first and second time intervals having a fixed relation to the time intervals during which the first neutron source and the second neutron source are turned on and are irradiating said earth formation.

3,942,005

ELECTRON SCANNING APPARATUS

Tadao Watanabe, Katsuta, Japan, assignor to Hitachi, Ltd., Japan

Filed Dec. 12, 1974, Ser. No. 532,178
Int. Cl.² G01N 23/00; G21K 7/00; H01K 37/26
U.S. Cl. 250—310 4 Claims



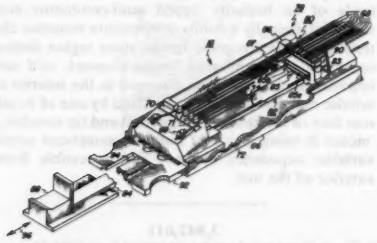
1. An electron scanning apparatus comprising scanning means for two-dimensionally scanning a specimen with a primary electron beam, means for radiating the surface of said specimen with said primary electron beam in the form of spot, a couple of detector means for detecting information generated from said specimen by said scanning means and said radiating means, display and recording means for displaying and recording said information in response to the output signal from said detector means, and first switching means for selectively alternating between said scanning means and said radiating means.

3,942,006

CORONA GENERATOR CLEANING APPARATUS

Thomas F. Hayne, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 16, 1972, Ser. No. 307,250
Int. Cl.² H01G 1/06; H01T 19/04
U.S. Cl. 250—326 8 Claims



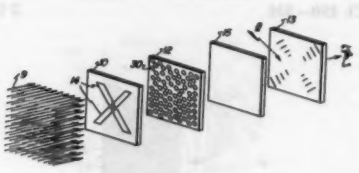
1. A corona generating apparatus, including:
an elongated shield defining an open ended chamber;
a pair of spaced substantially parallel conductive coronode wires mounted in said shield extending substantially in a longitudinal direction along the length of said shield;
a plurality of spaced, substantially parallel grid wires mounted in said shield extending substantially in a longitudinal direction along the length thereof, said plurality of grid wires partially enclosing the open end of said shield with one said coronode wires being disposed in the chamber therebeneath and the other of said coronode wires being disposed in the unenclosed portion of the chamber of said shield;
a wiper member positioned within said shield contacting said pair of coronode wires and the interior surface of said grid wires opposed from said pair of coronode wires; and
means for moving said wiper member in substantially a longitudinal direction along the length of said pair of coronode wires and said grid wires.

3,942,007

LIQUID CRYSTALLINE IMAGE CONVERTER

Franklin D. Saeva, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 29, 1974, Ser. No. 465,049
Int. Cl.² G01F 1/13
U.S. Cl. 250—331 5 Claims



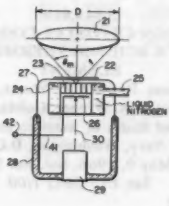
1. A method for converting an infrared image to a visible image, comprising:
a. providing a film of an optically negative liquid crystalline material in contact with an insoluble material; said optically negative liquid crystalline material having a reflection band with center wavelength λ_o; said insoluble material, when in contact with said optically negative liquid crystalline material, becoming extrinsically optically active and having an absorption band in the visible within which circular dichroism is induced;
b. impinging one side of said film of optically negative liquid crystalline material with imagewise configured infrared radiation to change the position of said reflection band with center wavelength λ_o;
c. providing on the other side of said film of optically negative liquid crystalline material, in turn, a quarter waveplate and a linear polarizer; the slow axis of said quarter waveplate and the axis of polarization of said linear polarizer having an angular relationship of about 45°; whereby an image corresponding to said infrared image is observed within the wavelength range of said light absorption band.

3,942,008

THERMAL IMAGING DEVICE

Clifford F. Eve, Murrysville, and Max Garbuny, Pittsburgh, both of Pa., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 23, 1974, Ser. No. 535,242
Int. Cl.² H01J 31/49
U.S. Cl. 250—332 7 Claims



1. In a far infrared image converter with a lens system defining an image plane a photosensitive element comprising:

a bundle of optical fibers each having a first end face in said image plane and a second end face in a resolving plane; and

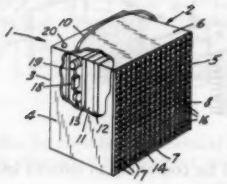
a single continuous planar electrical heat detecting retina mounted in parallel relationship to said resolving plane and spaced less than 0.1 mm from all of said second end faces.

3,942,009

DIRECTIONAL RADIATION DETECTOR

Allen L. Taylor, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 23, 1974, Ser. No. 500,147
Int. Cl.² G01T 1/16
U.S. Cl. 250—338 **2 Claims**



1. A directional thermal detector for sensing temperature variations of a structure and comprising:

a layer of poled, polymeric pyroelectric, infrared radiation sensitive material that produces electrostatic charges on its surfaces when its ambient temperature is varied, the charges produced on one surface of said layer being opposite in polarity to the charges on the opposite surface of said layer;

a first layer of electrically conductive material carried on said one side of said pyroelectric layer to serve as an electrode for collecting the electrostatic charges produced on said one side;

a second layer of electrically conductive material carried on said opposite side of said pyroelectric layer to serve as an electrode for collecting the electrostatic charges on said opposite side;

sensing circuitry connected across said first and second conductive layers for detecting and indicating electrostatic charges thereon;

shield means for insulating said opposite side of said pyroelectric layer from exposure to infrared radiation; and

directional screen means that includes a panel juxtaposed with said first conductive layer and having a plurality of axial passages aligned perpendicular to said conductive layer for limiting the exposure of said conductive layer to infrared radiation from the structure being detected, and thereby restrict the viewing angle of the detector.

3,942,010

JOULE-THOMSON CRYOSTAT COOLED INFRARED CELL HAVING A BUILT-IN THERMOSTAT SENSING ELEMENT

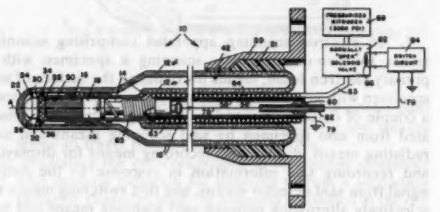
Eugene W. Peterson; Howard P. Wurtz, Jr., both of Santa Barbara, and Marvin R. Winner, Goleta, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 9, 1966, Ser. No. 548,797
Int. Cl.² G01J 1/00
U.S. Cl. 250—352 **5 Claims**

1. A cryogenic infrared energy sensing unit having a built-in Joule-Thomson cryogenic cooler of the type utilizing exhaust refrigerant gas to regeneratively cool the refrigerant supply line and having a built-in thermostat sensing element for providing an electrical signal to control operation of the cooler, in combination, comprising,

a. a double walled, Dewar type thermal insulation casing having a closed and an open end, the interior of the casing forming an elongated central cryostat chamber, the closed end of the thermal insulation casing forming the front end of the unit and containing an infrared sensor element affixed to the interior surface of the inner wall of the double walled casing, the outer wall of the casing at the front end being formed of an infrared energy window material,

b. a cryostat assembly shaped for insertion in the cryostat chamber and adapted to cool the exterior surface of the inner wall of the double walled casing at the front end, said cryostat assembly comprising a two-piece mandrel consisting of a rear thin walled tubular member and metallic heat exchange front end tip member plugging the front end of the tabular member, and a refrigerant supply tube helically wrapped around the two-piece mandrel terminating at its forward direction with an open end to



form the gas expansion nozzle to provide the Joule-Thomson cooling effect, the construction being such that the helically coiled refrigerant is supported between the tubular member of the two-piece mandrel and the wall of the cryostat chamber in a manner permitting counterflow of the exhaust gases from the front to rear end of the cryostat chamber about the helical tubing in the annular space between the mandrel and the lateral wall of the cryostat chamber,

c. a temperature responsive variable impedance element made of an impurity doped semi-conductor material which intrinsically exhibits temperature sensitive characteristics at the cryogenic temperature region desired for operation of the infrared sensor element, said variable impedance element being disposed in the interior of the tubular mandrel element and affixed by one of its sides to rear face of the heat exchange front end tip member, and

d. means forming a pair of output connections across the variable impedance element and accessible from the exterior of the unit.

3,942,011

GAMMA CAMERA DISPLAY SYSTEM

Karl J. Stout, Hudson, Mass., assignor to Raytheon Company, Lexington, Mass.

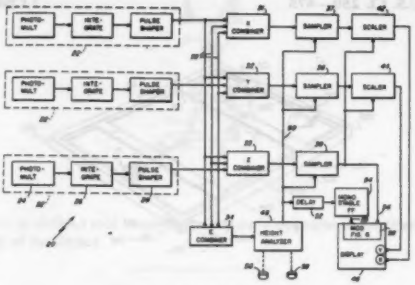
Continuation-in-part of Ser. No. 418,157, Nov. 21, 1973. This application Dec. 23, 1974, Ser. No. 535,892
Int. Cl.² G01T 1/164
U.S. Cl. 250—363 S **4 Claims**

1. A camera system comprising:

an array of detectors of radiant energy positioned in a predetermined pattern for receiving such energy, each of said detectors providing a signal upon being illuminated with such energy;

means coupled to said detectors for combining signals of said detectors, said combining means including means for weighting signals of said detectors in accordance with the positions of individual ones of said detectors in said array to provide the coordinate positions of points in an image;

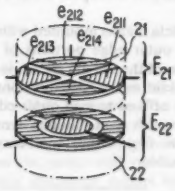
means coupled to said detectors for summing together signals of said detectors to provide a sum signal; and display means coupled to said combining means for displaying said points of said image, said displaying means including a control electrode for varying the intensity of said displayed points, said sum signal of said summing means being coupled to said control electrode for modulating the intensity of said displayed points in accordance with their positions relative to an array of said detectors.



3,942,012
SYSTEM FOR MONITORING THE POSITION, INTENSITY, UNIFORMITY AND DIRECTIVITY OF A BEAM OF IONIZING RADIATION

Rene Boux, Paris, France, assignor to C.G.R.-Mev, Paris, France

Filed Jan. 21, 1974, Ser. No. 434,912
Claims priority, application France, Jan. 26, 1973, 73.02839
Int. Cl.² G01T 1/18; H01J 39/28
U.S. Cl. 250—385 6 Claims



1. In a safety system for monitoring the intensity, uniformity and orientation of an incident beam of ionizing radiation, in combination:

a housing transparent to said radiation centered on an axis and forming at least one ionization chamber provided with ion-collecting electrode means; and

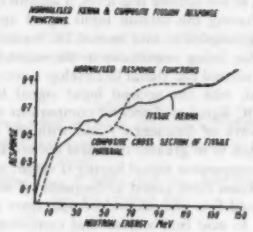
evaluation means connected to said electrode means;

said electrode means comprising a plurality of mutually insulated conductive elements transparent to said radiation with major surfaces transverse to said axis positioned to intercept different portions of the incident beam, certain of said elements being at least partly disposed in a central zone containing said axis, other of said elements being exclusively disposed in a peripheral zone surrounding said central zone, said evaluation means including circuitry for comparing the rates of ion collection by said elements in said central and peripheral zones.

3,942,013
COMPOSITE FISSION DOSEMETER FOR FAST NEUTRONS

Robert Crawford Lawson; David Porter, both of Glasgow, and William James Hannan, Airdrie, all of Scotland, assignors to National Research Development Corporation, London, England

Filed Nov. 20, 1973, Ser. No. 417,600
Claims priority, application United Kingdom, Nov. 22, 1972, 53892/72
Int. Cl.² G01T 3/00
U.S. Cl. 250—391 1 Claim

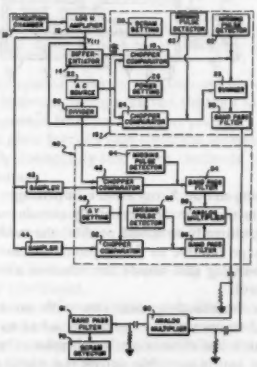


1. A method of measuring neutron doses comprising providing a composite detector material for the neutrons consisting of at least two fissile elements, the fission cross-section versus neutron energy response curves of which combine to match the kerma versus neutron energy response of a known biological material and exposing said detector material to neutrons and said elements including 237_{Np} in the range of 30% to 11% and 238_U in the range of 70 to 89% , respectively by weight.

3,942,014
LOGIC ELEMENTS FOR REACTOR PERIOD METER

William P. McDowell, and James P. Bobis, both of Downers Grove, Ill., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Mar. 20, 1975, Ser. No. 560,429
Int. Cl.² G01T 3/00, 1/18
U.S. Cl. 250—392 9 Claims



1. A logical device for indicating the condition of the value of a first input signal being equal to or greater than a first trip

level and simultaneously the value of a second input signal being equal to or greater than a second trip level, comprising:

first DC means for developing a first DC signal corresponding to the first trip level, a first chopper comparator having the first input signal applied thereto and being coupled to said first DC means, said first comparator being responsive to the first input signal and said first DC signal to develop a first comparator signal, with the first input signal less than said first DC signal said first comparator signal being a square wave of frequency *f* and with the first input signal equal to or greater than said first DC signal said first comparator signal having 0 value,

second DC means for developing a second DC signal corresponding to the second trip level, a second chopper comparator having the second input signal applied thereto and being coupled to said second DC means, said second comparator being responsive to the second input signal and said second DC signal to develop a second comparator signal, with the second input signal less than said second DC signal said second comparator signal being a square wave of frequency *f* and with the second input signal equal to or greater than said second DC signal said second comparator signal having 0 value, and

a first bandpass filter tuned to frequency *f* and being coupled to said first and second comparators and being responsive to said first and second comparator signals to develop a first AC alarm signal of frequency *f* with either of said comparator signals of frequency *f* and having zero value with both said comparator signals not of frequency *f*.

3,942,015

ROTATING-ANODE X-RAY TUBE

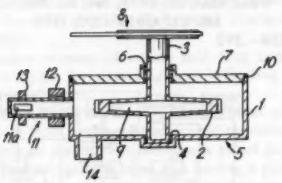
Hugh Esmor Huxley, Cambridge, England, assignor to National Research Development Corporation, London, England

Filed Oct. 24, 1974, Ser. No. 517,826

Claims priority, application United Kingdom, Nov. 1, 1973, 50841/73

Int. Cl.² H01J *35/04*

U.S. Cl. 250—406 **6 Claims**



1. A rotating-anode X-ray tube comprising:

an anode in the form of a generally circular wheel having a rim of uniformly serrated profile, the width of said rim being large relative to the depth of the serrations;

means mounting said anode for rotation about the axis of said wheel;

means for bombarding said rim with an electron beam directed transversely to said axis so as to impinge on a spot which has dimensions small relative to the width of said rim and is movable across the width of said rim by deflection of said beam; and

an envelope surrounding said anode and said bombarding means and provided with a port which will permit the emergence from said envelope, in a direction nearly parallel to said axis, of X-rays generated by the impingement of said electron beam on said spot.

3,942,016

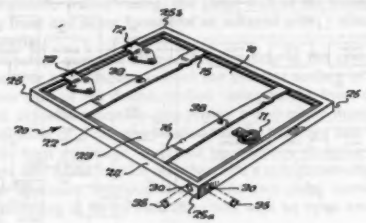
FILM CASSETTE

Joseph S. Schatz, Brooklyn, N.Y., assignor to Wolf X-Ray Corporation, Jamaica, N.Y.

Filed June 29, 1971, Ser. No. 158,019

Int. Cl.² G03B *41/16*

U.S. Cl. 250—475 **7 Claims**



1. A light-opaque cassette for X-ray film comprising, in combination:

a rectangular front panel of X-ray transparent material for supporting X-ray film;

a removable back panel overlying the film and having a planar surface in facing relationship therewith;

means for holding the back panel in fixed relationship with the film;

a rectangular frame member disposed about the periphery of the panels, said frame member having face portions forming a back opening for receiving the back panel and a front opening for receiving the front panel and having inner and outer edge portions extending in planes perpendicular to said planar surface, the dimensions of said rectangular front panel being larger than the corresponding dimensions of said front opening but being smaller than the corresponding dimensions of the rectangle formed by said inner edge portions, the outer edge portions meeting at the corners of said frame member, each of said outer edge portions including an indentation in close proximity to but spaced from one of said corners; and

identifying indicia means mounted within the indentation in each of the outer edge portions of said frame member such that one of the indicia means is visible upon viewing any one of said outer edge portions, the indicia means being rigidly affixed to said outer edge portion and serving to distinguish said cassette from similarly situated cassettes, the film within said cassettes being visually indistinguishable.

3,942,017

APPARATUS FOR IRRADIATION WITH ELECTRON BEAM

Kenichiro Uehara; Atsuo Ito; Koichi Nishimune, and Kazutoshi Fujita, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Sept. 9, 1974, Ser. No. 504,557

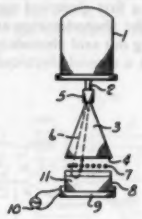
Claims priority, application Japan, Sept. 11, 1973, 48-102470; Sept. 11, 1973, 48-102471; Dec. 17, 1973, 48-142094; Mar. 30, 1974, 49-36028

Int. Cl.² A61K *27/02*

U.S. Cl. 250—492 B **4 Claims**

1. An apparatus for irradiating a linear article with high energy electrons which comprises an electron accelerator having means to oscillate an electron beam transversely to the direction of movement thereunder of a linear article to be irradiated, means for simultaneously passing different portions of the linear article under said oscillating beam a plurality of times for irradiation, and means underlying said oscillating beam and the linear object to be irradiated for generating a

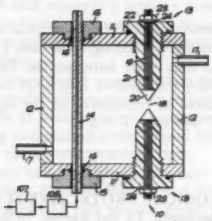
magnetic field perpendicular to the scanning plane of said oscillating beam, said magnetic field having a strength sufficient to deflect said beam approximately opposite to its direction of incidence.



3,942,018
PRODUCTION OF ULTRA-VIOLET RADIATION

David Preston Simpson, Chester, England, assignor to The Electricity Council, England

Filed July 9, 1974, Ser. No. 486,793
Claims priority, application United Kingdom, July 9, 1973, 32593/73
Int. Cl.² H01J 37/26
U.S. Cl. 250—493 13 Claims



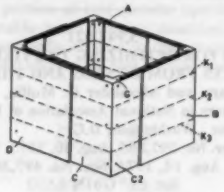
1. A method of producing U.V. radiation comprising the steps of providing a discharge chamber, at least a portion of which is transparent to U.V. radiation, and a pair of spaced apart electrodes therein, supplying water to the region between the electrodes, and applying a high voltage between the electrodes whereupon the water undergoes electrical breakdown and an electrical discharge occurs between the electrodes, the electrodes and the supply of water being so arranged that at least a part of the electrical discharge path is submerged in the water to produce thereby a hot submerged plasma of ionized water which is unable to expand freely and which emits U.V. radiation.

3,942,019
ELECTRON COLLIMATOR

Geoffrey Maximilian Lawrence Claridge; Brian Sydney Driver, and Timothy Robert Jarvis, all of Sussex, England, assignors to U. S. Philips Corporation, New York, N.Y.

Filed Apr. 24, 1974, Ser. No. 463,676
Claims priority, application United Kingdom, Apr. 17, 1973, 18438/73
Int. Cl.² A61N 5/10; G21F 5/04; G21K 1/04
U.S. Cl. 250—512 5 Claims

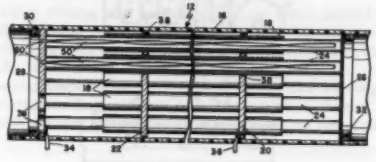
1. An electron beam collimating device, comprising an open ended structure having a substantially rectangular shape, said structure comprising four wall portions of which at least parts are substantially electron impermeable, said wall portions being interlaced with and movable relative to each other and defining a passageway for said beam, each of said wall portions comprising first and second wall structures angularly disposed with respect to each other.



3,942,020
CORONA DISCHARGE OZONE GENERATOR

David F. Ciambrone, Santee, Calif., assignor to Cubic Corporation, San Diego, Calif.

Filed Dec. 9, 1974, Ser. No. 530,933
Int. Cl.² C01B 13/11
U.S. Cl. 250—539 4 Claims



1. A corona discharge ozone generator comprising:
a frame comprising an elongated cylindrical pipe housing,
a plurality of outer electrodes comprising elongated tubes and supported on said frame,
a plurality of inner electrodes comprising elongated elements received within said elongated tubes coaxial with said elongated tubes and spaced said elongated tubes,
flow means for conveying gas between and along said inner and outer electrodes,
said outer electrodes and said inner electrodes including electrical terminal means for electrical connection across a source of high voltage,
at least one circular support plate having an outer diameter substantially equal to the inner diameter of said pipe housing,
a plurality of spaced holes in said support plate,
said outer electrodes being received through said holes and being supported from said support plate,
said support plate forming said electrical terminal means for electrically connecting said outer electrode to the source of high voltage,
said flow means for conveying gas between and along said inner and outer electrodes comprising an elongated cylindrical dielectric element interposed between said inner and outer electrodes,
said dielectric element extending axially beyond the ends of said outer electrodes,
said inner electrodes terminating at a first end thereof beyond the end of said dielectric elements and at a second end thereof terminating short of said dielectric elements,
a first circular end plate abutting said first ends of said dielectric element and being electrically connected to said inner electrodes,
said first circular plate including a pattern of holes corresponding to the relative spacing of said outer electrodes but being rotationally displaced therefrom to comprise openings for admitting gas to said electrodes, and

said electrodes are received within said first circular end plate.

3,942,021

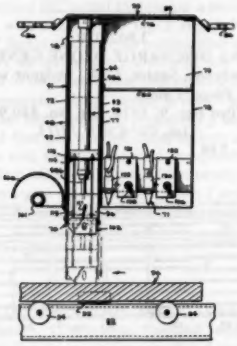
APPARATUS FOR OPTIMIZING THE YIELD OF USABLE PIECES FROM BOARDS AND THE LIKE

Anthony J. Barr, and Alexander G. Mullin, both of Raleigh, N.C., assignors to National Association of Furniture Manufacturers, Inc., Washington, D.C.

Division of Ser. No. 392,885, Aug. 30, 1973. This application Aug. 14, 1974, Ser. No. 497,387

Int. Cl.[2] G01N *21/32*

U.S. Cl. 250—572 **11 Claims**



5. In an apparatus for optimizing the yield of predetermined usable pieces from a workpiece such as a board of lumber or the like having randomly disposed defects in at least one plane surface thereof, a scanner-marker unit comprising a carrier assembly movable relative to said workpiece along the length thereof, means mounted on said carrier assembly for detecting defects on said workpiece and means mounted on said carrier assembly for marking cutting lines on said workpiece, said defect detecting means including means for illuminating defect designating indicia applied to a plane surface of said workpiece, a plurality of transversely disposed reading heads and means for moving said plurality of reading heads selectively into and out of engagement with said workpiece, each of said reading heads having a plurality of transversely disposed photosensitive cells for sensing light from said indicia and for providing signals which form a primary bit matrix corresponding to the scanned defect designating indicia, said reading heads being displaceable vertically relative to successive reading heads to permit the position of each reading head to adjust vertically and conform to any variations in thickness of said workpiece as said unit traverses the length thereof.

3,942,022

RAPID RESPONSE CORRELATION TYPE IMAGE MOTION SENSOR

Kenneth D. Stumpf, Chelmsford, and John T. Watson, Lexington, both of Mass., assignors to Itek Corporation, Lexington, Mass.

Filed Oct. 25, 1974, Ser. No. 518,014

Int. Cl.[2] H01J *39/12*

U.S. Cl. 250—578 **3 Claims**

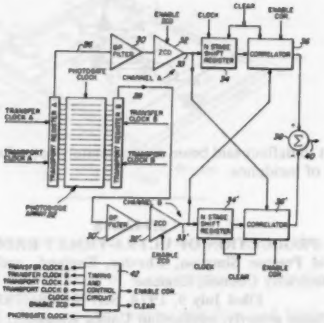
1. A system for determining movement of a light pattern and comprising:

a. an array of photodetectors;

b. means for forming said light pattern on said array of photodetectors;

c. means for reading out said array of photodetectors at a time T to obtain a first electrical signal indicative of the light pattern on the photodetector array at time T;

d. means for reading out said photodetector array at a time T + ΔT to obtain a second electrical signal indicative of



the light pattern on the photodetector array at time T + ΔT; and

e. means for correlating said first electrical signal at time T with said second electrical signal at time T + ΔT to determine relative time shift between the first and second signals, whereby the relative time shift between the signals is indicative of movement of the light pattern between time T and time T + ΔT.

3,942,023

RADIOLOGICAL PROTECTIVE SCREEN

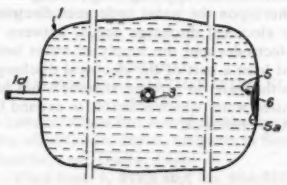
Richard Bruno Flaugnatti, 13, rue Racine, 76 Saint-Etienne Du Rouvray, France

Filed Dec. 27, 1973, Ser. No. 428,776

Claims priority, application France, Dec. 28, 1972, 72.46742

Int. Cl. G21f *3/00*

U.S. Cl. 250—515 **16 Claims**



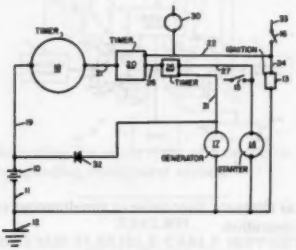
1. A mortar based protective screen, for radiotherapeutic purposes and placed on a patient's skin, comprising: a flexible and leakproof jacket having two parallel walls; a side wall joining the said two parallel walls and having a surface area small relative to that of each parallel wall; at least one settable resin within said jacket; a fine particulate filler of at least one substance which absorbs radiotherapeutic radiation and is evenly mixed with the said resin; and a window permeable to radiotherapeutic radiation and positioned to permit radiation to pass between the parallel walls of the jacket.

3,942,024

AUTOMOBILE ENGINE WARMER

Dickey E. Ingham, 522 Plumer St., Oil City, Pa. 16301

Filed Oct. 11, 1974, Ser. No. 514,098
Int. Cl.² H02P 9/04
U.S. Cl. 290—38 R 1 Claim



1. A starting device in combination with an automobile having an ignition system, a starter motor, a generator or alternator, a battery, and a heater motor, a first timer and a second timer and a third timer,

said first timer, said second timer, and said third timer being connected in series with each other, said third timer having first means connected to said generator and second means connected to said starter motor,

said first timer and said second timer being connected in series with said automobile ignition system,

said first timer having means thereon to complete said series circuit from said battery to said second timer at a predetermined time,

said second timer being connected to means on said first timer to actuate said second timer connecting said ignition system to said battery through said first timer and connecting said second timer to said battery through said first timer for a predetermined time,

said third timer being adapted to connect said starter motor to said battery for a predetermined time determined by said first timer and said second timer when said second timer is actuated and,

means on said third timer connected to said generator for disconnecting said starter motor from said battery when said generator produces a voltage of a predetermined value.

3,942,025

PROCESS FOR STORING ELECTRICITY FOR A FAST ADVANCING CONVEYANCE AND DEVICE FOR STORING SUCH ELECTRICITY

Zaisui Ri, 4-4, Takamatsucho, Takarazuka, Japan

Filed Apr. 22, 1974, Ser. No. 462,676
Int. Cl.² F03D 9/00; H02P 9/04
U.S. Cl. 290—55 1 Claim

1. A device for storing electricity for a fast moving conveyance comprising:

a wind mill having a rotating shaft with radially and linearly extending arms, the latter having ends defining substantially circular openings, said shaft being disposed on a fast moving conveyance;

generator means connected to said rotating shafts of said wind mill for causing electricity to be generated;

means for charging and storing the generated electricity, and being connected to said generator means;

said wind mill includes a plurality of substantially bowl-like wings disposed in said circular openings, respectively, and including a bottom plate provided at a bottom edge portion of each of said wings;

a hinge disposed on each of said ends of said arms adjacent a radially innermost portion of said circular openings and pivotally connecting said wings to said arms at a radially innermost portion of said wings, respectively, said wings having a radially outermost free end adjacent a radially outermost portion of said circular openings, said wings being pivotable in an opening direction constituting a direction outwardly relative to the interior of the bowl-like wings and uncovering said circular openings, and said

wings closing said circular openings when pushed in a direction towards the inside of said bowl-like wings and abutting said bottom plate, whereby further pivoting in the latter direction is prevented; and

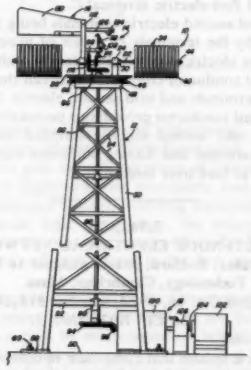
a spring disposed on each of said hinges and abutting the corresponding said arm on a linear portion thereof on a side thereof opposite said opening pivoting direction.

3,942,026

WIND TURBINE WITH GOVERNOR

Frank H. Carter, 428 North St., Taft, Calif. 93268

Filed June 11, 1974, Ser. No. 478,773
Int. Cl.² F03D 9/00; H02P 9/04
U.S. Cl. 290—55 6 Claims



1. A wind turbine assembly comprising a supporting framework including a rigid elevated platform, a turntable rotatably supported from said platform for swivelling movement about a substantially vertical axis, a horizontal shaft rotatably journalled from the turntable with the end portions of the shaft projecting diametrically therefrom, a plurality of wind wheels mounted on each end of the horizontal shaft outwardly of the turntable for rotating the shaft in response to axial flow of wind through the wind wheels, the area peripherally of said

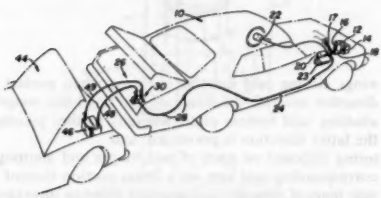
wind wheels being unconfined to provide unrestricted and untrapped wind flow in relation to the wind wheels, a vertical shaft supported from the framework and drivingly connected to the horizontal shaft, a generator assembly supported at the lower end of the framework and being drivingly connected to the vertical shaft, a wind rudder connected with the turntable for maintaining the rotational axis of the horizontal shaft generally parallel to the wind direction, and governor means driven from the horizontal shaft for increasing the load on the vertical drive shaft by the generator assembly in response to the rotational speed of the horizontal shaft above a predetermined rpm for preventing over-speeding of the wind wheels.

3,942,027

INTERNALLY MOUNTED BATTERY JUMP CABLES

Raoul Fima, 4711 St. Joseph Creek, Lisle, Ill. 60532

Filed May 24, 1974, Ser. No. 472,996
Int. Cl.² H02G 3/00
U.S. Cl. 307—10 R **3 Claims**



1. In an automobile having a first compartment and a second compartment spaced from said first compartment, an engine and a battery for turning over and starting said engine, said battery having a pair of terminals and being mounted in said first compartment with one terminal thereof connected to the frame of said automobile, the combination comprising

a terminal box mounted in said second compartment,

a first electric terminal carried by said box and electrically connected to the frame of said automobile,

a second electric terminal carried by said box and insulated from said first electric terminal,

said first and second electric terminals being adapted to be gripped by the terminals of a pair of jumper cables for respective electrical connection to said cables,

an insulated conductor connected between the other of said battery terminals and said second electric terminal,

said insulated conductor providing a permanent connection between said second electric terminal and said other battery terminal and having sufficient current carrying capacity to turn over said engine.

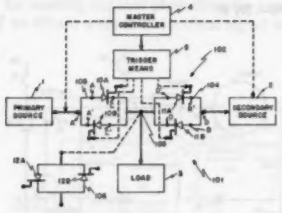
3,942,028

MULTI-NODE ELECTRICAL NETWORK

Richard H. Baker, Bedford, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Oct. 16, 1974, Ser. No. 515,284
Int. Cl.² H02J 7/00
U.S. Cl. 307—66 **11 Claims**

1. An electric system that comprises, in combination, a first source of a-c electric energy, a second source of a-c electric energy, means maintaining the first source and the second source in time phase, a load and a multinode network interconnection the first source, the second source and the load, said multi-node network comprising at least two sets of SCRs, each set comprising a pair of parallel-connected and oppositely polarized SCRs, said two sets being connected together to provide a common connection between the pairs to permit current to pass from the first source through one pair to the common connection and thence to the load, through said one pair to the common connection and thence through the other pair to the second source, and from said second source through said other pair to the common connection and thence



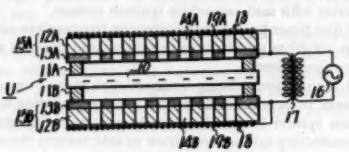
to the load, as alternate, successive or simultaneous conditions of network operation.

3,942,029

ELECTROSTATIC TRANSDUCER

Hirotake Kawakami, and Kantaro Takada, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed July 17, 1974, Ser. No. 489,400
Claims priority, application Japan, July 23, 1973, 48-82821
Int. Cl.² H04R 19/00
U.S. Cl. 307—88 ET **8 Claims**



1. An electrostatic transducer comprising:

a. an electret diaphragm having a monocharge at its surface;

b. an electrode mounted adjacent said electret diaphram and spaced a predetermined distance therefrom;

c. electrically conductive shielding means for electrostatically shielding said electret diaphragm; and

d. means for connecting said electrically conductive shielding means with said electrode to maintain said electrically conductive shielding means and electrode at the same potential.

3,942,030

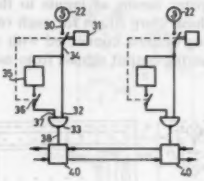
ARRANGEMENT FOR DETECTING DIELECTRIC BREAKDOWNS IN METAL-CLAD HIGH-VOLTAGE SWITCHING AND TRANSMISSION INSTALLATIONS

Willi Olsen; Manfred Lieske; Wolfgang Ehmann; Dieter Krause, and Gerhard Perst, all of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Mar. 18, 1974, Ser. No. 452,355
Claims priority, application Germany, Mar. 23, 1973, 2315322
Int. Cl. H01h 37/00; H02b 13/02
U.S. Cl. 307—117 **8 Claims**

1. An arrangement for detecting dielectric breakdowns in a metal-clad, high-voltage installation such as an equipment suitable for switching and transmitting high-voltages made up of a plurality of component sections sealed gastight one with respect to the other, the arrangement comprising: detection means at each of at least a portion of the component sections for detecting the temperature thereat and for providing a first quantity indicative of said temperature, ancillary means for providing a second quantity indicative of the temperature at the component section corresponding to said detection

means; and comparator means for receiving and comparing said first and second quantities to form an output signal there-



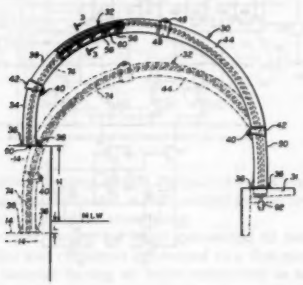
from for indicating the occurrence of a dielectric breakdown in the corresponding component section.

3,942,031

HIGH VOLTAGE FLEXIBLE CABLE SUPPORTED BY A CONTINUOUS RIGID BRIDGE FOR FLOATING PLATFORMS

George Bahder, Edison, and George S. Eager, Jr., Upper Montclair, both of N.J., assignors to General Cable Corporation, Greenwich, Conn.

Filed Nov. 19, 1974, Ser. No. 525,193
Int. Cl.² H02G *3/00*, *11/00*; G21D *1/00*
U.S. Cl. 307—147 16 Claims



1. A structure for supporting an electric power cable between a floating power station, that rises and falls with variations in the level of tidal water, and a second station at a fixed level, said structure comprising a stiffly flexible frame that extends upward at one end from the floating power station and that curves through an arc in a substantially vertical plane to its other end which extends downward to the fixed station, and rigid connections at both ends of the frame holding the frame on both stations and against angular movement with respect to both stations whereby change in the level of the first station with respect to the second station bends the frame throughout the full length thereof, and means on the frame for holding a power cable along the arc of said frame.

3,942,032

POWER INJECTOR CONTROL MEANS FOR TRANSMISSION NETWORKS

John A. Casazza, 302 Passaic Ave., Hasbrouck Heights, N.J. 07604

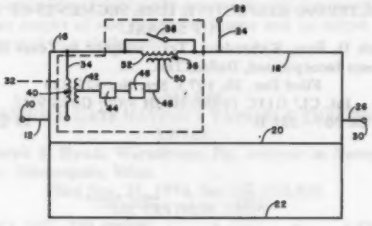
Filed Feb. 15, 1974, Ser. No. 442,779
Int. Cl.² H02J *3/00*
U.S. Cl. 307—148 15 Claims

1. In an AC transmission network for supplying power, a power injection system for controlling current and power flow in separate portions of the network, said power injection system comprising:

a source of AC power;

a means to provide a DC source from said source of AC power;

a means to provide a rapidly controlled AC source from said DC source; and



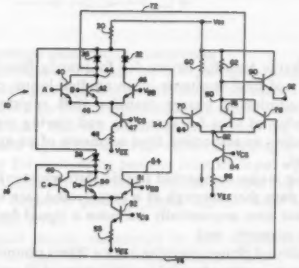
a means to employ said controlled AC source at the most advantageous locations in the network to control the magnitude and distribution of AC current and power.

3,942,033

CURRENT MODE LOGIC CIRCUIT

Frank J. Swiatowiec, Tempe, and Ramachandra A. Rao, Scottsdale, both of Ariz., assignors to Motorola, Inc., Chicago, Ill.

Filed May 2, 1974, Ser. No. 466,116
Int. Cl.² H03K *17/00*
U.S. Cl. 307—215 6 Claims



1. A non-saturating logic circuit comprising:

a. an M number of current mode input gates, each current mode input gate including a group of common collector node input logic switching transistors, and an interconnected reference voltage switching transistor;

b. a first node logic connection, the reference voltage switching transistor associated with each of the M input gates being collector dotted to the first node logic connection;

c. a current mode output gate, the output gate including an input switching transistor coupled to the first node logic connection and M interconnected selectively enabled reference transistors;

d. a first load diode coupled to a reference voltage source means and to the first node logic connection for establishing a logic level signal swing at the input switching transistor of the output gate in response to the application of input logic signals to the input gates;

e. each of the M reference transistors of the output gate being coupled, respectively, to one of the group of common collector node input logic switching transistors so as to be selectively enabled; and

f. the output gate being responsive to a logic level signal swing at the first node logic connection and to the selec-

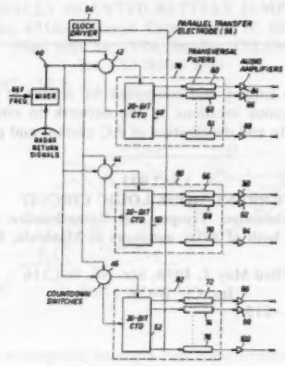
tive enabling of the M reference transistors for generating an output logic level signal.

3,942,034

CHARGE TRANSFER DEVICE FOR FREQUENCY FILTERING RESPECTIVE TIME SEGMENTS OF AN INPUT SIGNAL

Dennis D. Buss, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 28, 1973, Ser. No. 429,229
Int. Cl.² G11C 19/00; H03H 9/00; G01S 9/42
U.S. Cl. 307—221 D 15 Claims



1. A charge transfer device for frequency filtering each of a plurality of time segments of an applied input, comprising

a demultiplexing charge transfer shift register having a plurality of sites for receiving and storing signals corresponding to respective time segments of an applied input signal,

clocking means connected to said shift register for transferring data therethrough at a preselected rate so that each of said sites sequentially includes a signal for a separate time segment, and

a plurality of charge transfer device filters connected to said respective sites of said demultiplexing shift register and to said clocking means,

said clocking means transferring stored signals from said sites of said demultiplexing register into said filters so that only related time segment signals are applied to each of said filters,

each of said filters having a passband for isolating a desired frequency or range of frequencies present in the time segment signal assigned thereto.

3,942,035

CHARGE COUPLED DEVICE SIGNAL PROCESSING APPARATUS USING CHIRP-Z-TRANSFORM TECHNIQUES

Dennis Darcy Buss, Cambridge, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed June 26, 1974, Ser. No. 483,337
Int. Cl.² G11C 19/00; H03H 7/10; G01S 9/42
U.S. Cl. 307—221 D 9 Claims

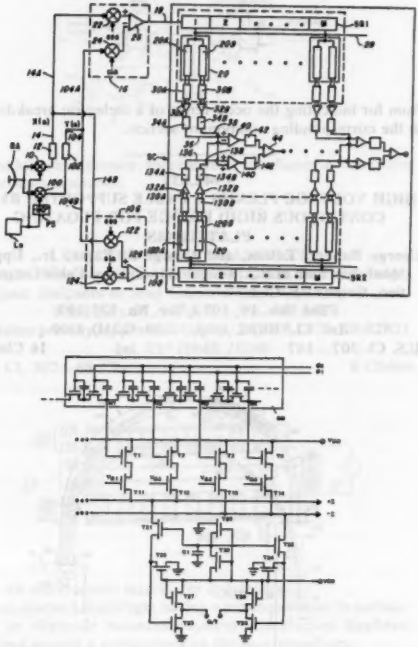
1. Signal processing apparatus including a semiconductor substrate incorporating:

charge transfer device shift register means having a plurality of bits each defining at least one charge storage site for storing signals inputted into said shift register;

said semiconductor substrate further incorporating for each bit of said shift register, in-phase charge transfer device chirp Z-transform filter means and quadrature-phase charge transfer device chirp Z-transform filter means;

transfer means for transferring signals stored in the bits of said shift register means as inputs to the in-phase and quadrature-phase chirp filters for each respective bit;

said filters having outputs connected with means for summing and squaring output signals from said filters.



5. Signal processing apparatus including chirp-Z transform charge transfer device correlation filter means including in-phase and quadrature-phase signal transmission paths; and means for weighting time sampled analog input signals by an amplitude modulated chirp signal and for applying said weighted signals as inputs to said filter means.

3,942,036

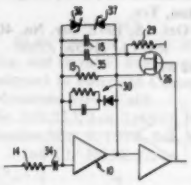
BRAKE FORCE CONTROL SYSTEM FOR VEHICLES ESPECIALLY MOTOR VEHICLES

Manfred H. Burckhardt, Waiblingen; Hellmut Krohn, Esslingen; Horst Grossner, Geradstetten, and Hans-Jörg Florus, Goppingen, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Division of Ser. No. 177,744, Sept. 3, 1971, Pat. No. 3,802,747. This application Feb. 6, 1974, Ser. No. 440,008
Claims priority, application Germany, Sept. 5, 1970, 2044045
Int. Cl.² H03K 17/00
U.S. Cl. 307—229 15 Claims

1. A threshold switching arrangement for use in brake force control systems and the like, characterized by an operational amplifier means having an input, an output and a feedback circuit means between said input and output including a parallel resistance-capacitance network means and further means connected with said network means for changing its operability in relation to a predetermined threshold value of the opera-

tional amplifier means, said further means including a further network connected in parallel with said network means and



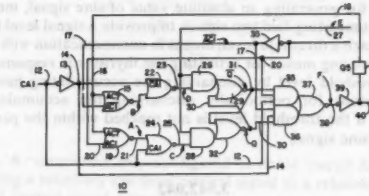
including a parallel connected resistance-condenser circuit series connected with a diode.

3,942,037

MOS EDGE SENSING CIRCUIT

William David Mensch, Jr., Mesa, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Filed Sept. 6, 1974, Ser. No. 503,993
Int. Cl.² H03K 5/153, 5/13, 5/34, 5/36
U.S. Cl. 307—232 10 Claims



8. A transition sensing circuit connected to an input conductor, an enable conductor, a first control conductor, and a second control conductor comprising:

a first inverter having an input connected to said input conductor and an output connected to a first node;

a second inverter having an input connected to said first control conductor and an output connected to a second node;

a first NOR gate having an input connected to said second control conductor, another input connected to said second node, and an output connected to a third node;

a second NOR gate having an input connected to said second control conductor, and another input connected to said first control conductor and an output connected to a fourth node;

a third NOR gate having an input connected to said first node, another input connected to said third node, and an output connected to a fifth node;

a fourth NOR gate having an input connected to said fourth node, and another input connected to said input conductor and an output connected to a sixth node;

and AND gate having an input connected to said enable conductor and another input connected to said fifth node;

a second AND gate having an input connected to said enable conductor and another input connected to said sixth node;

a fifth NOR gate having an input connected to an output of said first AND gate and another input connected to a seventh node and an output connected to an eighth node;

a sixth NOR gate having an input connected to said eighth node and another input connected to an output of said second AND gate and an output connected to said seventh node;

a third AND gate having an input connected to said first control conductor, another input connected to said eighth node, an another input connected to said input conductor;

a fourth AND gate having an input connected to said seventh node, another input connected to said first node, and another input connected to said second node; and

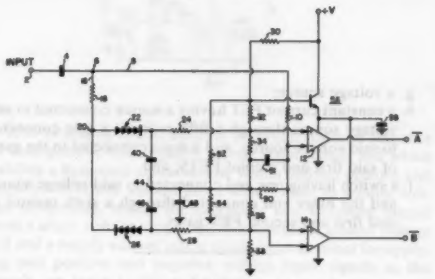
a seventh NOR gate having one input connected to an output of said third AND gate another input connected to an output of said fourth AND gate and an output connected to a ninth node.

3,942,038

THRESHOLD GATE HAVING A VARIABLE THRESHOLD LEVEL

Frederick S. Hutch, Warminster, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 21, 1974, Ser. No. 525,956
Int. Cl.² H03K 5/20
U.S. Cl. 307—235 J 4 Claims



1. A threshold gate circuit comprising

a signal comparator means for comparing the amplitude of an input signal applied thereto with a threshold level and to produce an output signal having a duration determined by the time that the input signal exceeds the threshold level, said signal comparator means including a first comparator for comparing positive polarity input signals with a first threshold level and a second comparator for comparing negative polarity input signals with a second threshold level,

input signal means connected to said signal comparator means to apply an input signal thereto, and

threshold level generating means connected between said input signal means and said comparator means to generate a threshold level for said signal comparator means which threshold level is a predetermined portion of the amplitude of said input signal, said threshold generating means including first means for generating said first threshold level and second means for generating said second threshold level.

3,942,039

DISTORTIONLESS FET SWITCHING CIRCUIT

Masafumi Kikuchi, Atsugi, and Masashi Takeda, Isehara, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 20, 1974, Ser. No. 471,595
Claims priority, application Japan, May 24, 1973, 48-58391
Int. Cl.² H03K 17/60, 17/66, 17/10, 5/00
U.S. Cl. 307—251 6 Claims

6. An FET switching circuit comprising:

a. input and output terminals;

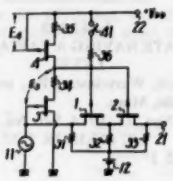
b. a first FET having a source directly connected to said input;

c. a second FET having a source directly connected to the first FET drawn and a drawn directly connected to the output terminal;

d. a bias source;

e. first, second, and third resistors connecting the bias source to each of the drain and source terminals of said first and second FETs;

f. a source follower FET having a gate connected to the input terminal, a grounded drain, and a source connected to both gates of the first and second FETs through a fourth resistor;



g. a voltage source;

h. a constant current FET having a source connected to said voltage source through a fifth resistor, a gate connected to said voltage source, and a drain connected to the gates of said first and second FETS; and

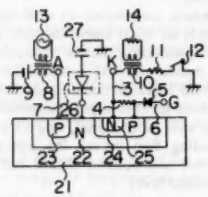
i. a switch having one end connected to said voltage source and the other end connected through a sixth resistor to said first and second FET gates.

3,942,040

SEMICONDUCTOR SPEECH PATH SWITCH CIRCUITRY

Shinzi Okuhara, Fujisawa, Japan, assignor to Hitachi, Ltd., Japan

Filed June 28, 1974, Ser. No. 484,320
Claims priority, application Japan, July 2, 1973, 48-73729
Int. Cl.² H03K 17/56
U.S. Cl. 307—252 G 14 Claims



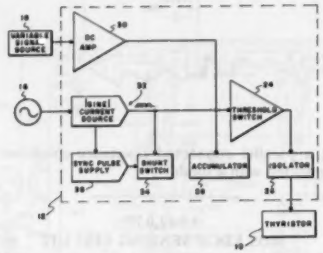
1. A semiconductor speech path switch circuit comprising a semiconductor device having a four-region structure of PNPN with three PN junctions, terminals provided respectively to the four regions of said semiconductor device, an impedance element connected between the terminals provided to two of said four regions forming therebetween one of said three PN junctions which is not adjacent to a substrate of said four regions having the lowest impurity concentration among said four regions and determining the breakdown voltage of said semiconductor device, and a variable impedance circuit connected to the terminal provided to said substrate region and exhibiting a high impedance in the turned-on state of said semiconductor device and a low impedance in the turned-off state of said semiconductor device.

3,942,041

THYRISTOR CONTROL CIRCUIT

James W. Morriss, Carrollton, Tex., assignor to Atmos Corporation, Carrollton, Tex.

Filed Oct. 18, 1973, Ser. No. 407,582
Int. Cl.² H03K 17/00
U.S. Cl. 307—252 M 11 Claims



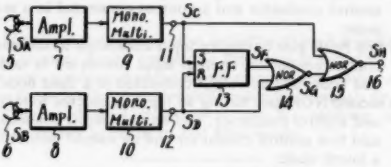
1. In a thyristor circuit for controlling high-power AC signals, a circuit for linearizing the thyristors control response, comprising: means for generating a variable level DC signal; means for generating an absolute value of sine signal; means for accumulating said two signals to provide a signal level that may reach a threshold level; means in communication with the accumulating means for activating the thyristor in response to the threshold level by discharging the accumulating means; and means for periodically discharging the accumulating means if the threshold level is not reached within the period of the sine signal.

3,942,042

PULSE WAVEFORM GENERATOR CIRCUIT

Akira Nikami, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sept. 25, 1974, Ser. No. 509,307
Int. Cl.² H03K 3/00; G11B 21/08
U.S. Cl. 307—268 12 Claims



1. A pulse waveform generator circuit comprising:

a. a first pulse generator means for producing a first pulse signal with a predetermined pulse width;

b. a second pulse generator means for producing a second pulse signal with a predetermined pulse width, said second pulse being produced between two successive first pulse signals;

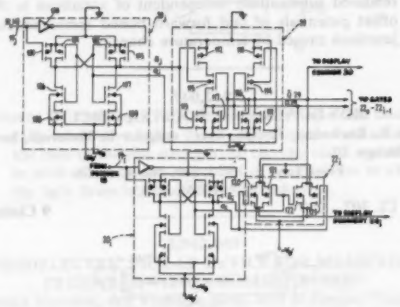
c. a flip-flop circuit set by said first pulse signal at its leading edge and reset by said second pulse signal at its leading edge;

d. a first logic circuit supplied with an output signal of said flip-flop circuit and with said second pulse signal and producing a third pulse signal which is held in one state from the trailing edge of said second pulse signal to the leading edge of said first pulse signal; and

e. a second logic circuit supplied with said third and first pulse signals and producing a fourth pulse signal which

changes level at every arrival of the trailing edges of said first and second pulse signals.

3,942,043
ELECTRONIC WATCH
Richard L. Sirocka, and David F. Broxterman, both of Sunnyvale, Calif., assignors to Fairchild Camera and Instrument Corporation, Mountain View, Calif.
Division of Ser. No. 320,223, Jan. 2, 1973, Pat. No. 3,815,354. This application May 9, 1974, Ser. No. 468,304
Int. Cl.[2] H03K 3/286
U.S. Cl. 307—279 1 Claim



1. A complimentarily configured bi-stable circuit for converting a relatively low level control signal to a relatively high level control signal comprising:

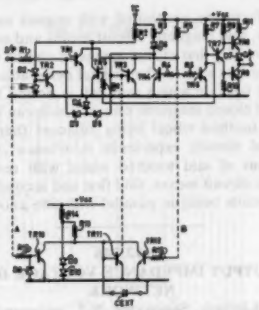
a control input for receiving said low level control signal;

an output terminal for manifesting said relatively high level control signal;

an input terminal adapted to be coupled to a source of relatively high voltage; and

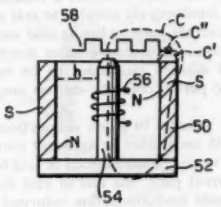
means switchable between opposite states in response to the appearance of said relatively low level control signal at said control input for coupling said input terminal to said output terminal, said coupling means comprising first and second pairs of parallel connected transistors of a first conductivity type, the commonly coupled sources of said transistors coupled to a reference potential, the gate of a first transistor of said first pair coupled to said control input; an inverter having an input coupled to said control input and an output, the gate of the first transistor of said second pair coupled to said inverter output, the commonly coupled drain of said second pair of transistors coupled to said output terminal; first and second transistors of opposite conductivity type to said first type coupled to the commonly connected drains of a different one of said first and second pairs, the gate of said first opposite conductivity type transistor coupled to the gate of a second transistor of said first pair, the gate of said second opposite conductivity type transistor coupled to the gate of a second transistor of said second pair, the commonly coupled gates coupled to the commonly coupled drains of the opposite pair of said first conductivity type transistors; and first and second constant current sources each comprising a conductively biased transistor of said opposite conductivity type, the drain terminal of said first and second constant current sources coupled to the source of said first and second opposite conductivity type transistors, respectively, the source terminal of said first and second constant current sources commonly coupled to said input terminal.

3,942,044
INTERFACE RECEIVER
Desmond Ross Armstrong, Mitcham, England, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Mar. 8, 1974, Ser. No. 449,355
Int. Cl.[2] H03K 3/286, 5/20
U.S. Cl. 307—290 17 Claims



1. A switching circuit adapted to switch states in response to both positive and negative voltage input signals and which exhibits a hysteresis characteristic within defined positive and negative threshold voltage limits with respect to ground voltage comprising, means for energizing said switching circuit from a single voltage supply applied between a ground voltage rail and a supply voltage rail, a signal input terminal for applying said positive and negative voltage input signals to the circuit, an input transistor having an input electrode connected to said signal input terminal, a transistor-diode current mirror having the collector of the current mirror transistor connected directly to the input electrode of the input transistor and the emitter of the current mirror transistor connected directly to the ground voltage rail, and means including said current mirror for defining one of the threshold voltage limits.

3,942,045
SPEED OR ANGULAR POSITION ELECTROMAGNETIC TRANSDUCER
Mario Palazzetti, Avigliana (Turin), Italy, assignor to Fiat Societa per Azioni, Turin, Italy
Filed June 5, 1974, Ser. No. 476,495
Int. Cl.[2] H02K 21/38
U.S. Cl. 310—155 1 Claim



1. In an electromagnetic angular speed or position transducer of the type having means defining a permanent magnetic circuit, including a cylindrical permanent magnet means having radial magnetization with two pole faces, a toothed wheel, which is relatively rotatable with respect to said cylindrical permanent magnet means to complete a magnetic circuit when positioned adjacent said pole faces whereby relative movement between the teeth of said toothed wheel and said pole faces causes regular changes to the reluctance of said magnetic circuit;

a coil wound onto said permanent magnet means in which an electric current is induced by flux changes resulting from said changes in reluctance;

the improvements comprising:

said coil is wound on a ferromagnetic core located axially within said cylindrical permanent magnet means forming part of said magnetic circuit of said permanent magnet, and

said pole faces are positioned with respect to one another whereby, said magnetic circuit means and said pole faces form part of a first closed magnetic circuit which can be completed by said toothed wheel being adjacent thereto, and said core on which said coil is wound forms part of a second closed magnetic circuit which can be completed by said toothed wheel being adjacent thereto whereby both said circuits experience reluctance changes upon movement of said toothed wheel with respect to said magnetic circuit means, said first and second closed magnetic circuits being in parallel with one another.

3,942,046

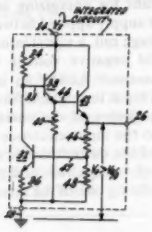
LOW OUTPUT IMPEDANCE VOLTAGE DIVIDER NETWORK

Allen LeRoy Limberg, Somerville, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 57,996, July 24, 1970, abandoned. This application Jan. 10, 1972, Ser. No. 216,686

Int. Cl.² H03K 17/00

U.S. Cl. 307—297 15 Claims



1. A dynamic potential divider having first and second terminals for application of potentials and a third terminal to provide intermediate potential output comprising:

first and second resistors;

a first transistor having an emitter electrode coupled by said first resistor to said first terminal, a collector electrode direct current conductively coupled to said second terminal by a first current path including said second resistor, a base electrode, and a base-emitter junction between said base and emitter electrodes to be maintained in forward bias to permit common-emitter amplifier operation thereof;

third and fourth resistors in series connection, their interconnection with each other being direct current conductively coupled to said base electrode of said first transistor by a third current path, the end of said fourth resistor remote from said interconnection returned to said first terminal; and

a second transistor having an emitter electrode direct current conductively coupled to said interconnection by means including said third resistor, a collector electrode direct current conductively coupled to said second terminal, a base electrode direct current conductively coupled to the collector electrode of said first transistor, whereby a second current path is established between the collector of said first transistor and the end of the third resistor remote from said interconnection, and a base-emitter junction between its said base and emitter electrodes to be maintained in forward bias to permit operation as a common-collector amplifier stage, said third terminal being connected at a point in the recited circuitry coupling the collector and base electrodes of said first transistor;

the ratio of the resistance of said second resistor to that of said first resistor being a positive number equal to the sum of (1) the number of forward biased semiconductor junctions in said first current path; (2) the number of forward biased semiconductor junctions in said second current path; (3) the number of forward biased semiconductor junctions in said third current path; and (4) the number of forward biased semiconductor junctions in said third current path multiplied by the ratio of the resistances of said third resistor to said fourth resistor, whereby the potential at the base electrode of said first transistor is rendered substantially independent of variations in the offset potentials of said forward biased semiconductor junctions caused by temperature changes.

3,942,047

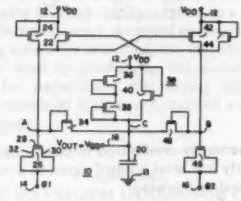
MOS DC VOLTAGE BOOSTER CIRCUIT

John K. Buchanan, Tempe, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Filed June 3, 1974, Ser. No. 475,366

Int. Cl.² H02M 3/155

U.S. Cl. 307—297 9 Claims



1. A voltage booster circuit coupled to a supply voltage conductor including a first MOSFET coupled between said supply voltage conductor and a first node for charging capacitance associated with the first node, a capacitor coupled between the first node and a first clock signal conductor, and a first diode-connected MOSFET coupled between the first node and a second node, the voltage booster circuit comprising:

a second diode-connected MOSFET having its gate and drain coupled to said supply voltage conductor and its source coupled to said second node, and third and fourth diode-connected MOSFETS coupled in series between said second node and said supply voltage conductor, the source of said fourth diode-connected MOSFET being coupled to said supply voltage conductor, the gate and the drain of said third diode-connected MOSFET being coupled to said second node.

3,942,048

PIEZOELECTRICALLY DRIVEN OPTICAL GRATING ASSEMBLIES

Jean Pierre Laude, Ballainvilliers, and Guy Pieuchard, Fontenay-le-Fleury, both of France, assignors to Jobin-Yvon, Longjumeau, France

Filed Nov. 25, 1974, Ser. No. 526,881

Claims priority, application France, Nov. 29, 1973, 73.42509

Int. Cl.² H01L 41/08

U.S. Cl. 310—8.1 7 Claims

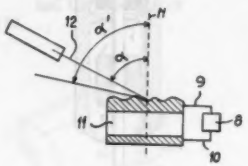
1. An optical modulator assembly comprising:

a substrate possessing piezo-electric properties and having two opposite faces,

electrically-conductive layers each carried by a respective one of said faces of the substrate, one of said layers having a reflective surface,

a grating carried by the one of said two opposite faces of the substrate which bears said reflective layer,

a light source for directing a beam of light at said grating, and



means for applying a variable voltage between said electrically-conductive layers to set up in the substrate an electric field of variable strength and thereby cause variations in pitch of the grating so as to vary the direction in which the light beam is reflected from the grating.

3,942,049
PIEZOELECTRIC PICK-UP DEVICE FOR MEASURING PRESSURES WITHIN HOLLOW BODIES

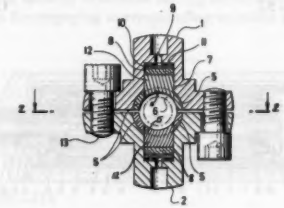
Blanka Hyanova, and Vladimir Plasil, both of Prague, Czechoslovakia, assignors to CKD Praha, oborovy podnik, Prague, Czechoslovakia

Filed Aug. 30, 1974, Ser. No. 502,067

Claims priority, application Czechoslovakia, Aug. 30, 1974, 6066-74

Int. Cl.² H01L 41/04

U.S. Cl. 310—9.1 **2 Claims**



1. A piezoelectric pick-up device for measuring the internal overpressure of a hollow cylindrical body on the basis of its elastic deformation, comprising a pick-up device having two opposed parts, a cavity provided in the pick-up device to enclose the measured cylindrical body therebetween, at least two opposed recesses in said pick-up device, a motion transmitting element and a piezoelectric plate arranged in each recess opposite to each other, each said motion transmitting element being arranged to provide mechanical communication between the associated piezoelectric plate and the outer surface of the measured body and being disposed symmetrically with respect to the axis of the measured body, a circular transverse groove machined in the cavity of the pick-up device, a multipart insert of a strong rigid metal fitting tightly in this circular groove, the radially inner surfaces of the motion transmitting elements and of the inserts forming circumferentially aligned segments cooperating to surround and accurately engage substantially the entire outer surface of the measured body, and means for clamping together the two parts of the pick-up device.

3,942,050
LINEAR MOTOR WINDING

Kurt Oberreti, Zurich, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

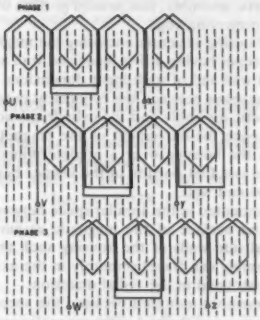
Continuation of Ser. No. 414,622, Nov. 12, 1973, abandoned.

This application Mar. 4, 1975, Ser. No. 555,263

Claims priority, application Switzerland, July 5, 1973, 9814/73

Int. Cl.² H02K 41/02

U.S. Cl. 310—13 **3 Claims**



1. In a linear type electrical motor comprising a toothed inductor component provided with an m-phase winding arranged in coils located in succession in slots established between the teeth and developing a p-number of pole pairs per phase and wherein q represents the number of slots per pole and phase, the improvement wherein even numbered coil groups up to the $(m-1)$th coil group out of a total of 2pm-coil groups is located at the end of the winding in a distance of q slots and in the same order.

3,942,051
SHOCK ACTUATED ELECTRICAL PULSE GENERATOR

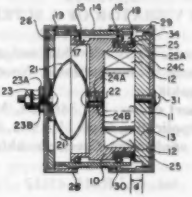
Harry T. Stevinson, and Douglas A. Baker, both of Ottawa, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Jan. 20, 1975, Ser. No. 542,366

Claims priority, application Canada, Feb. 13, 1974, 192370

Int. Cl.² H02K 33/00

U.S. Cl. 310—15 **17 Claims**



1. A shock-actuated electrical pulse generator which provides a double threshold discrimination of applied shock level and duration before full electrical pulse generation and which is operative in response to axial components of shock comprising:

a. a magnetic assembly formed of a cup-shaped portion having a generally cylindrical outer surface and a central rod-shaped portion extending upwardly from the inside bottom of the cup-shaped portion, said assembly including low reluctance material and permanent magnet material portions,

b. an electric coil positioned in the annular space between the inner surface of the cup-shaped portion and the rod-shaped portion of the magnetic assembly,

c. a generally flat disc-shaped removable keeper of low reluctance material making magnetic contact with the upper end of the rod-shaped portion of the magnetic assembly such as to form a closed magnetic circuit linking the coil, said keeper being in the form of a first portion and a second portion both of which are capable of acting as a partial keeper closing the said magnetic circuit and inducing a current pulse in the coil when pulled away frm the magnetic assembly, said second portion of the keeper having a projecting edge,

d. an outer housing structure enclosing the magnetic assembly and keeper having a first inner end wall and a second inner end wall and of such inner dimensions as to define an annular space between the cylindrical outer surface of the magnetic assembly and the cylindrical side walls and provide space for movement of the magnetic assembly axially in the housing over a predetermined travel distance, the said first portion of the keeper being attached to the first end wall,

e. bearings mounted in the annular space between the cylindrical outer surface of the magnetic assembly and the cylindrical side walls of the housing such that the magnetic assembly can travel smoothly in the axial direction but is constrained in the radial direction.

f. a spring member mounted between the second end wall of the housing and the end of the magnetic assembly away from the keeper and having a configuration such as to urge the said assembly away from the said end wall,

g. a limit stop on the inner surface of the housing and positioned in relation to the second portion of the keeper such that when a shock force of sufficient strength and duration is applied to the generator in the appropriate direction, the magnetic assembly, the coil and the second portion of the keeper acting as an inertial mass moves away from the end wall against the spring member separating the first keeper portion from the magnetic assembly and inducing a first electrical current pulse in the coil and travels on the bearings towards the second end wall until the projecting edge of the second keeper portion makes contact with the limit stop forcing it off the moving magnetic assembly and inducing a second much stronger electrical current pulse in the coil, and

h. electrical leads from said coil to the exterior of the housing.

3,942,052
TORSION VIBRATOR OF A SUPERSONIC VISCOSIMETER

Zdeno Figura, Bosaca, Czechoslovakia, assignor to Vyskumny ustav mechanizacia a automatizacie, Nove Mesto nad Vahom, Czechoslovakia

Continuation-in-part of Ser. No. 340,331, March 12, 1973, abandoned. This application Sept. 11, 1974, Ser. No. 505,060

Claims priority, application Czechoslovakia, July 19, 1972, 5107-72

Int. Cl.² H01L 41/12

U.S. Cl. 310—26 **5 Claims**

1. A torsion vibrator for a supersonic viscosimeter comprising in combination a case, an electrically conductive magnetostrictive bar having an upper and a lower end, a toroidal transformer for exciting said magnetostrictive bar, said magnetostrictive bar being connected with the case at its upper end by an upper coupling and at its lower end by a lower coupling, and passing through said toroidal transformer, a lower magnetostrictive resonator mechanically connected to the lower end of the magnetostrictive bar and extending freely from said case, an upper magnetostrictive resonator connected to the upper end of the magnetostrictive bar extending through said case, said magnetostrictive bar, said upper and lower couplings and said case combining to form the secondary winding of said toroidal transformer, and a pick-up coil

located within said case and surrounding the upper magnetostrictive resonator.

3,942,053
DEVICE FOR SECURING A SUPERCONDUCTIVE EXCITER WINDING IN THE ROTOR OF A TURBOGENERATOR

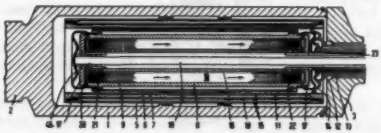
Arnold Abolins, Mulheim; Ernst Massar, Erlangen, and Erich Weghaupt, Mulheim, all of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Filed July 23, 1974, Ser. No. 491,105

Claims priority, application Germany, Aug. 6, 1973, 2339772

Int. Cl.² H02K 9/10

U.S. Cl. 310—52 **13 Claims**



1. Device for securing a superconductive exciter winding in a thermally insulating, thermally elastic and short-circuit proof manner within the rotor of a turbogenerator wherein the rotor has a body part thereof formed as a hollow cylinder, comprising a plurality of telescoping intermediate cylinders disposable within the hollow cylinder spaced from and coaxial to one another and to the hollow cylinder, said intermediate cylinders forming cold shields and vibration damping means, the hollow cylinder being closed at both ends thereof, a support cylinder located within and spaced from the innermost of said telescoping intermediate cylinders and adapted to support a superconductive exciter winding on the inner side thereof, said intermediate cylinders as well as said support cylinder are force-lockingly connected one to another with minimal contact areas through pairwise axially transposed articulating points to permit resiliency in radial direction and freedom to expand in axial direction, the spaces between said cylinders being evacuated so as to insulate said cylinders thermally one from the other, and a plurality of cooling circuit means for maintaining said cylinders individually at varying temperature levels.

3,942,054
STATOR WINDING FOR A MINIATURE BRUSHLESS DC MOTOR

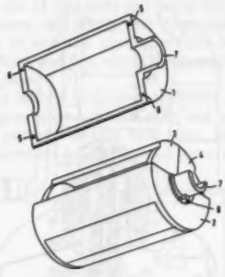
Reiner Kristen, and Manfred Liska, both of Nurnberg, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Nov. 14, 1974, Ser. No. 523,850

Claims priority, application Germany, Nov. 30, 1973, 7342752[U]

Int. Cl.² H02K *1/18*

U.S. Cl. 310—179 **6 Claims**



1. In a stator winding for a miniature brushless dc motor, comprising a plurality of component windings designed as frame windings injection molded in plastic and nested together to form a cylinder for enclosing the permanent magnet rotor of the motor which cylinder is inserted into a ring-shaped magnetic return yoke without slots, wherein the improvement comprises means on at least one end face of the cylinder formed by the frame windings for connecting the cylinder in a form fitted manner with the housing of the motor, said means comprising a cylindrical tubular extension extending from at least one end face of the frame winding on the outside, said tubular extension having formed thereon radial projections for engaging corresponding recesses in said housing.

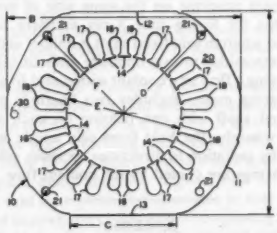
3,942,055
HERMETIC MOTOR STATOR

William R. Hoffmeyer, Holland, Mich., assignor to General Electric Company, Fort Wayne, Ind.

Filed Oct. 16, 1974, Ser. No. 515,149

Int. Cl.² H02K *1/00*

U.S. Cl. 310—216 **7 Claims**



1. A stator for a dynamoelectric machine comprising: a plurality of laminations each having a plurality of angularly spaced apart, coil accommodating slots; a first distributed phase winding arranged in a plurality of said slots and including at least two coil groups defining at least two predetermined primary magnetic poles; and a second distributed phase winding defining at least two auxiliary magnetic poles angularly displaced from the primary magnetic poles; the at least two predetermined magnetic poles having a polar axis; each first distributed phase winding coil group being symmetrical about the polar axis; the first slot each side of the axis established by the first phase winding being of a first predetermined area; three slots next adjacent each first slot being of a second predetermined area, and two slots of a third predetermined area next adjacent to the slots of the second predetermined area; the slots of a third predetermined area being larger than the slots of a second predetermined area, and the slots of a second predetermined area being larger than the slots of a first predetermined area thereby to permit the effective utilization of congenerous types of auxiliary windings in a given stator core structure.

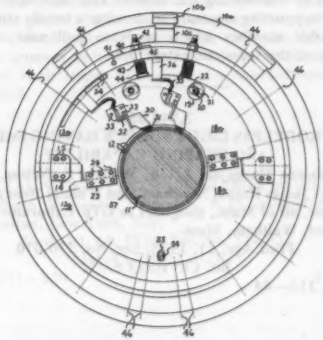
3,942,056
BRUSH HOLDER AND A RIGGING ASSEMBLY FOR A DYNAMOELECTRIC MACHINE

Adolph J. Gehring, Jr., Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 27, 1975, Ser. No. 562,537

Int. Cl.² H02K *13/00*

U.S. Cl. 310—241 **11 Claims**



1. An improved brush rigging assembly for use with a dynamoelectric machine having a stator member and a rotor member, said rotor member including a plurality of commutator segments forming a cylindrical commutator member, comprising:

a. a yoke member having a surface concentric with a surface of the rotor;

b. a plurality of brush holders mounted on the yoke member; and

c. means for resiliently mounting the yoke member to the stator so that the brush holders are normally spaced a distance, *a*, from the commutator segments and so that the yoke member surface is normally spaced a distance, *b*, less than the distance, *a*, from said rotor surface whereby when the dynamoelectric machine is subjected to a high shock force the rotor surface contacts the yoke surface which prevents the brush holders from coming in contact with the commutator segments.

3,942,057
FLEXIBLE BELT ARRANGEMENT FOR SECURING WINDING CONDUCTORS

Harold M. Philofsky, Pittsburgh, and Julius J. Wu, Murrysville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 15, 1975, Ser. No. 541,366

Int. Cl.² H02K *3/46*

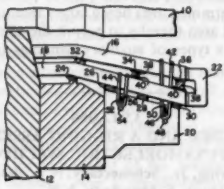
U.S. Cl. 310—260 **9 Claims**

1. Electromechanical apparatus having a stator iron core, comprising:

stator end winding conductors extending from the stator iron core;

a non-metallic supporting structure coupled to the stator iron core;

a resilient and flexible member reinforced with non-metallic cores of twisted strands, said flexible member having two



ends and being disposed around a portion of an end winding conductor; and

means for connecting the ends of said flexible member to the supporting structure to develop a tensile stress in the flexible member which tends to pull said conductor toward the supporting structure.

3,942,058

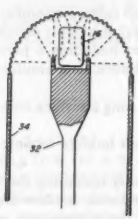
ELECTRODELESS LIGHT SOURCE HAVING IMPROVED ARC SHAPING CAPABILITY

Paul Osborne Haugsjaa, Acton; William F. Nelson, Weston; Robert James Regan, Needham, and William Henry McNeill, Carlisle, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Apr. 21, 1975, Ser. No. 570,070

Int. Cl.² H01J *61/52*

U.S. Cl. 313—44 **7 Claims**



1. A light source including,

a. a source of power at a high frequency,

b. an electrodeless lamp having an envelope made of a light transmitting substance and a volatile fill material enclosed within the envelope, the fill material emitting light upon breakdown and excitation;

c. a termination fixture having an inner conductor and an outer conductor disposed around the inner conductor, the conductors having a first end which couples power to the lamp and a second end which is coupled to the source; and

d. means operatively associated with the fixture for shaping the arc within the lamp during excitation so that the arc does not attach to the interior wall of the envelope thereby enhancing the life of the electrodeless lamp.

3,942,059

HIGH POWER X-RAY TUBE

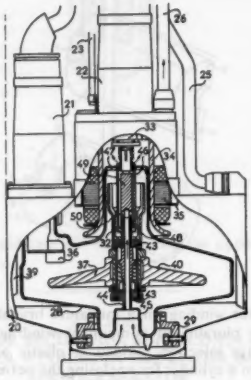
Dang Tran-Quang, Paris, France, assignor to Compagnie Generale de Radiologie, Paris, France

Filed June 12, 1974, Ser. No. 478,709

Claims priority, application France, June 29, 1973, 73.24042

Int. Cl.² H01J *35/04*

U.S. Cl. 313—60 **5 Claims**



1. A high-power X-ray tube including in combination an evacuated envelope; and within said envelope: a motor assembly including a fixed shaft attached to said envelope, a rotor with a rotatable shaft extending therefrom and bearing means for mounting said rotor and said rotatable shaft on said fixed shaft; a disc-shaped anode carried by said rotatable shaft, said anode being made of graphite and having a convex face facing away from its axis of rotation and coated on at least a major portion thereof by a layer of an X-ray emissive refractory metallic material having a much lower coefficient of thermal emissivity than its other, graphite face; and a cathode assembly for generating an electron beam directed toward said convex, coated face of said anode;

wherein the improvement, in view of reducing the transfer of heat from the anode toward the rotor and of providing an increased power output, further comprises in combination: means for mounting said anode on said rotatable shaft with its convex, coated face turned in the direction of said rotor and means for mounting said cathode assembly on said envelope on the same side of said anode as said rotor for facing said X-ray emissive layer-coated face, and wherein said fixed shaft is hollow and connected by its extremities to two opposite ends of said envelope for carrying a flow of a coolant within said fixed shaft, and said bearing means includes two bearings mounted on said fixed shaft with one bearing on each side of said anode, whereby the heat from said anode is evacuated mainly by radiation in directions opposite said rotor and said bearings are cooled by the coolant flow.

3,942,060

GASEOUS DISCHARGE TYPE DISPLAY PANEL FOR DISPLAYING LARGE NUMBER OF CHARACTERS

Edgar L. Harvey, Old Bridge, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Filed Jan. 17, 1975, Ser. No. 541,736

Int. Cl.² H01J *61/067, 61/10, 61/30*

U.S. Cl. 313—188 **5 Claims**

1. A display panel comprising

a gas-filled envelope made up of a base plate and a face plate having a viewing window,

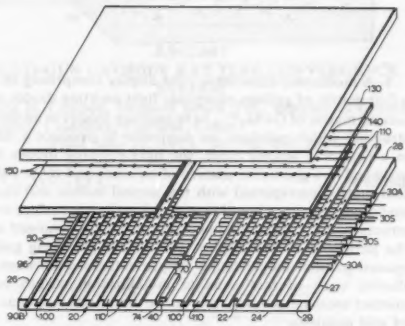
a plurality of first slots formed in the top inner surface of said base plate and extending along the length thereof,

a transverse slot formed in the top inner surface of said base plate at about its center to divide said base plate into left and right portions,

an insulating rod seated in said transverse slot,

an array of first electrodes seated in said first slots in said left portion of said base plate and a similar array of first electrodes seated in said first slots in said right portion of said base plate, the inner ends of said first electrodes extending out of said slots and being bent transversely in said transverse slot where they terminate, with the first electrodes in said left portion of said base plate being insulated from said first electrodes in said right portion of said base plate,

a plurality of second strip-like electrodes disposed in left and right groups on said base plate and overlying the left and right portions of said base plate, respectively, said second electrodes being oriented transverse to said first



electrodes, each such second electrode having at least one hole aligned with one of said slots, each crossing of a first electrode and a second electrode defining a scanning cell, said scanning cells being arrayed in rows and columns,

a pair of apertured insulating plates comprising left and right plates seated on said second electrodes, with said left plate overlying the left portion of said base plate and said right plate overlying said right portion of said base plate, there being a space between said apertured plates, said space being generally aligned with said transverse slot in said base plate, the apertures in said plates being arrayed in rows and columns and comprising display cells, each display cell being vertically aligned with a scanning cell, and

a plurality of wire electrodes disposed on the top surface of said left apertured plate, each aligned with a row of said apertures therein, and a similar plurality of wire electrodes disposed on the top surface of said right apertured plate and each aligned with a row of said apertures therein.

3,942,061

GAS DISCHARGE PANEL

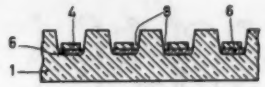
Johannes van Esdonk, and Johannes Petrus Hornman, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 22, 1974, Ser. No. 526,135

Claims priority, application Netherlands, Dec. 20, 1973, 7317435

Int. Cl.² H01J *61/00*

U.S. Cl. 313—188 **3 Claims**



1. A gas discharge panel comprising an insulating base plate and a transparent insulating top plate, a set of parallel conductors which are insulated from each other in each plate and which cross each other at an angle, said conductors being spaced at the crossings to define cavities which are filled with an ionizable gas in which a gas discharge can occur, the electrodes of one of said sets constituting cathodes being positioned in grooves and are secured to the insulating plate throughout their length by means of a low softening-point glass enamel.

3,942,062

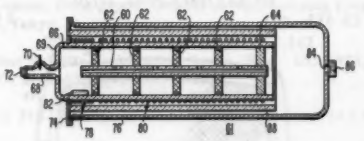
METAL VAPOR LASER DISCHARGE DEVICE

Karl Gerhard Hernqvist, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 15, 1974, Ser. No. 514,935

Int. Cl.² H01J *61/30*

U.S. Cl. 313—220 **2 Claims**



1. A metal vapor laser discharge device which is responsive to a given operating voltage applied thereto for producing a discharge therein, said device comprising:

a longitudinal bore tube having open ends;

a second tube coaxially surrounding said bore tube and extending over at least the full length of said bore tube, said second tube comprising a hollow cylindrical portion coaxially surrounding said bore tube, a transverse end wall at one end of said cylindrical portion, and a tubular neck extending outwardly from said end wall;

means for preventing vapor discharge in a region between said bore tube and said second tube;

a metalic vapor source within said second tube;

two electrodes positioned near opposite ends of said bore tube; and

a gas filled envelope enclosing at least the portion of said second tube surrounding said bore tube, the one end of the cylindrical portion extending outside said envelope.

3,942,063

INCANDESCENT LAMP HAVING INCREASED LIFE

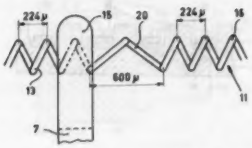
Frederik Nicolaas Winter, and Wilhelmus Martinus Jozef Van Gils, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 10, 1974, Ser. No. 432,282

Claims priority, application Netherlands, Feb. 14, 1973, 7302046

Int. Cl.[2] H01K *1/14*

U.S. Cl. 313—315 3 Claims



1. An incandescent lamp which comprises a coiled coil filament disposed in a lamp envelope, said coiled coil having end portions, a central portion intermediate said end portions and first axial portions intermediate said central portion and each end portion, a first current supply wire, engaging one end portion of said filament and a second current supply wire engaging the other end portion of said filament, said first axial portions having at least one turn with a pitch larger than the pitch of said central portion, said central portion having substantially higher temperature during operation than said first axial portions and emitting substantially all of the light from said filament.

3,942,064

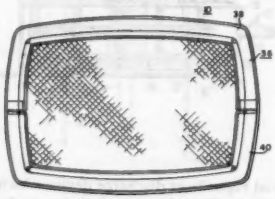
REINFORCING RING STRUCTURE FOR A SHADOW MASK

George D. Dimmick, Bath; Kevin J. Rhodes, Montour Falls, and Richard W. Uzumecki, Horseheads, all of N.Y., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 14, 1974, Ser. No. 523,945

Int. Cl.[2] H01J *29/07*, *31/20*

U.S. Cl. 313—407 2 Claims



1. A generally rectangular reinforced shadow mask for a color television picture tube comprising a thin metal sheet having a front section with a curved apertured transmission area, an imperforate margin area around the apertured transmission area, a further imperforate skirt portion bent back orthogonal to the margin area, the terminal portion of the skirt portion bent inwardly forming an attachment flange, and a generally planar rectangular back ring attached in surface supporting relationship to the flange, the improvement wherein the generally planar rectangular back ring is formed of a plurality of elongated pieces which are rigidly connected at their end portions to form the rectangular back ring, the overlap connection between pieces is made by providing an elbow like end portion on one end of each piece extending first from the plane of the piece and then generally parallel to the plane of the piece, with the dimension between the parallel planes being approximately equal to the piece thickness, the other end of each piece is planar and is disposed against the generally parallel portion of the elbow like end portion, with the number of pieces and the locus of connections symmetrical relative to the four corners of the rectangular back ring formed thereby, and wherein the overlapped pieces are spot welded together at the overlap where the planar end of one piece is disposed against the generally parallel portion of the elbow like end portion.

3,942,065

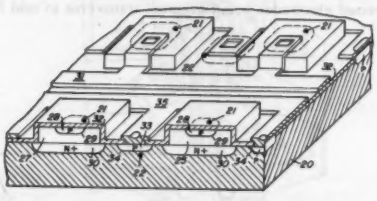
MONOLITHIC, MILTICOLOR, LIGHT EMITTING DIODE DISPLAY DEVICE

Malcolm J. Russ, Scottsdale, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Continuation of Ser. No. 230,923, Feb. 29, 1972, abandoned. This application Nov. 11, 1974, Ser. No. 522,548

Int. Cl.[2] H05B *33/26*

U.S. Cl. 313—500 3 Claims



1. A multicolor monolithic light display comprising at least a first matrix of gallium phosphide light emitting diodes and a second matrix of $GaAs_XP_{1-X}$ light emitting diodes in an integral structure which matrices are scannable to produce a display in a first or a second color, the light emitting diodes being arranged in a geometric pattern of columns and rows with the first matrix interspersed with the second matrix and each of said diodes having a junction exposed at the top surface of said structure, and column and line address means arranged about the periphery of the display, said means including pairs of spaced parallel metallization stripes extending between said diodes. each of said pairs of metallization stripes having contact means extending in opposite directions to contact one of said matrices.

3,942,066

VELOCITY MODULATION TUBE INCLUDING A HIGH RESONANCE-FREQUENCY FLOATING PREBUNCHER HAVING A Q-VALUE LOWER THAN A LOW RESONANCE-FREQUENCY INPUT CAVITY

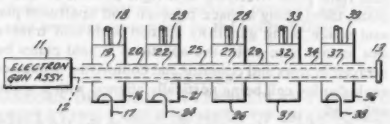
Takao Kageyama, and Yosihiro Morizumi, both of Tokyo, Japan, assignors to Nippon Electric Company Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 408,186, Oct. 19, 1973, abandoned. This application Feb. 24, 1975, Ser. No. 552,436

Claims priority, application Japan, Oct. 25, 1972, 47-106800

Int. Cl.[2] H01J *25/10*

U.S. Cl. 315—5.43 9 Claims



1. In a velocity modulation tube operable in a predetermined operating passband of frequencies, comprising in a vacuum envelope and successively in mutually spaced relation electron gun means for emitting an electron beam, an input

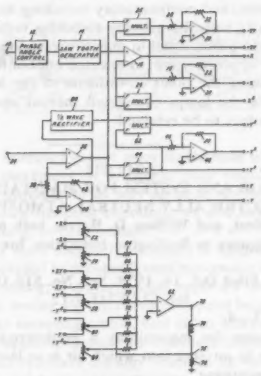
resonator circuit having means for coupling thereto a source of energy external to said vacuum envelope, a first and a second floating resonator circuit, an output resonator circuit having means for coupling thereto a load external to said vacuum envelope, and a collector electrode for said electron beam, each of said input, first and second floating, and output resonator circuits having interaction gap means operatively associated with said electron beam for providing interaction between said electron beam and an electromagnetic field induced in the associated resonator circuit, said tube further comprising a plurality of drift spaces for said electron beam extending from the interaction gap means of said input resonator circuit backwardly of said electron beam towards said electron gun means, extending between said interaction gap means of said input, first and second floating, and output resonator circuits, and extending from the interaction gap means of said output resonator circuit forwardly of said electron beam towards said collector electrode, said second floating and output resonator circuits having fundamental modes of resonance at a frequency higher than the highest frequency of said passband and at an approximate center of said passband, said second floating resonator circuit having a Q-value greater than said input resonator circuit, the improvement wherein said input and said first floating resonator circuits have fundamental modes of resonance at frequencies adjacent to the lowest and the highest frequencies of said passband, respectively, and said first floating resonator circuit has a Q-value which is at most equal to the Q-value of said input resonator circuit.

3,942,067

MULTI-GUN CATHODE RAY TUBE CONVERGENCE SYSTEM

George H. Cawood, Ormond Beach, Fla., assignor to General Electric Company, Fairfield, Conn.

Filed June 21, 1974, Ser. No. 481,761
Int. Cl.² H01J *29/50, 31/00*
U.S. Cl. 315—13 C **4 Claims**



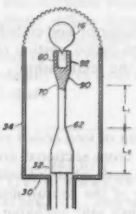
4. In a convergence circuit for a multi-gun cathode-ray tube comprising means for providing a correction circuit of the form $AY + BY^2 + CX + DX^2 + EXY$, where X and Y are proportional to the horizontal and vertical deflection magnitudes, respectively, and A, B, C, D, and E are constants, the improvement comprising means for providing in the correction current a further component $FY(\text{positive})^3$ where F is a constant and $Y(\text{positive})^3$ is the cube of only the positive values of Y.

3,942,068

ELECTRODELESS LIGHT SOURCE WITH A TERMINATION FIXTURE HAVING AN IMPROVED CENTER CONDUCTOR FOR ARC SHAPING CAPABILITY

Paul Osborne Haugsjaa, Acton; William Henry McNeill, Carlisle; Robert James Regan, Needham, and Joseph Martin Lech, Westford, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Apr. 21, 1975, Ser. No. 570,069
Int. Cl.² H01J *7/46*
U.S. Cl. 315—39 **28 Claims**



1. A light source including:

a. a source of power at a high frequency,

b. an electrodeless lamp having an envelope made of a light transmitting substance and a volatile fill material enclosed within the envelope, the fill material emitting light upon breakdown and excitation;

c. a termination fixture having an inner conductor and an outer conductor disposed around the inner conductor, the conductors having a first end which couples power to the lamp and a second end which is coupled to the source; and

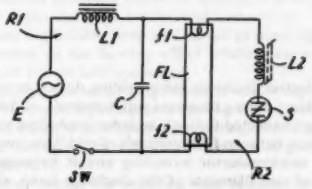
d. the inner conductor having means at the first end thereof for controlling the electric field strength in a region adjacent to the interior wall of the envelope to inhibit the formation of an arc within the region.

3,942,069

DISCHARGE LAMP LIGHTING APPARATUS AND METHOD

Isao Kaneda, Otsu, Japan, assignor to NEC Sylvania Corporation, Tokyo, Japan

Filed Sept. 9, 1974, Ser. No. 504,242
Claims priority, application Japan, Sept. 13, 1973, 48-103407; Sept. 13, 1973, 48-103408
Int. Cl.² H05B *37/00, 41/23*
U.S. Cl. 315—99 **14 Claims**



1. In a discharge lamp lighting apparatus including a first oscillation circuit adapted to be connected to a power source and including a linear inductor and a capacitor connected in series, a second oscillation circuit connected across said capacitor and having a bounce booster saturable inductor and a voltage responsive switching element connected in series, and a third oscillation circuit including said bounce booster saturable inductor and its distributed capacity, whereby a discharge lamp may be connected across said capacitor, said switching

element having a breakdown voltage within a range of from above a virtual voltage across said discharge lamp, as lighted, to below the maximum instantaneous voltage of said power source, whereby said first, second and third oscillation circuits generate a high oscillation voltage across said capacitor for starting said discharge lamp; the improvement wherein said bounce booster saturable inductor comprises a magnetic core and a coil, said core having a coiled portion around which said coil is wound, and a non-coiled portion free of said coil, said core having a core factor K defined by the relationship:

$$K = K_1 + K_2$$

where K_1 is the core factor of said coiled portion and K_2 is the core factor of said non-coiled portion of said core, said core factors K_1, K_2 having the relationship:

$$K_1 > K_2$$

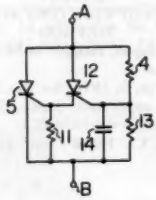
the cross sectional area of said coiled core portion being less than one half of the cross sectional area of said non-coiled portion, the magnetic path length of said coiled portion being less than one quarter of the overall magnetic path length of said core, whereby when said discharge lamp remains lighted the equivalent inductance of said bounce booster saturable inductor increases to block a peak value of a voltage across said discharge lamp to avoid actuation of said second oscillation circuit and to avoid repetitive unoscillating operation of said discharge lamp.

3,942,070

ELECTRIC DISCHARGE LAMP LIGHTING DEVICE

Teruichi Tomura, Kunitachi; Mitsuo Akatsuka, and Hiroyuki Iyama, both of Tokyo, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Sept. 10, 1974, Ser. No. 504,705
Int. Cl.² H05B 41/23
U.S. Cl. 315—101 31 Claims



1. An electric discharge lamp lighting device comprising a discharge lamp having filaments with terminals, said discharge lamp being connected through an inductive ballast to an A.C. power source between first terminals of said filaments thereof, and to a semiconductor switching circuit between second terminals of said filaments of the discharge lamp, said semiconductor switching circuit including:

a first thyristor;

a second thyristor whose anode and cathode are connected to the anode and gate of said first thryistor, respectively; and

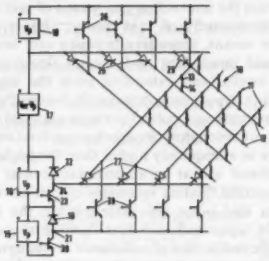
an integration circuit including at least a capacitor and connected between the anode and the cathode of said first thyristor, said capacitor, being connected between the gate of said second thyristor and the cathode of said first thyristor.

3,942,071

GAS-DISCHARGE DISPLAY DEVICE DRIVING CIRCUITS

Peter Eric Krebs, Hale, and Frank Walters, Bury, both of England, assignors to Ferranti, Limited, Hollinwood, England

Filed Nov. 1, 1974, Ser. No. 520,343
Claims priority, application United Kingdom, Nov. 3, 1973, 51132/73
Int. Cl.² G09F 13/22; H05B 33/00
U.S. Cl. 315—169 TV 12 Claims



1. A driving circuit arrangement for a gas-discharge display device of the type having a two co-ordinate array of direct current gas-discharge lamps, a set of anode conductors interconnecting the anodes of discharge lamps extending along different values of one co-ordinate of the array and a set of cathode conductors interconnecting the cathodes of the lamps extending along different values of the other co-ordinate of the array, comprising means for applying across all of the discharge lamps a retaining voltage of insufficient magnitude to initiate a discharge in any lamp but of sufficient magnitude to maintain a discharge, primary switching means operable to apply to a conductor extending along one co-ordinate of the array an extinguishing pulse of magnitude and sense to reduce the retaining potential difference across the lamps connected to that conductor below the level required to retain a discharge therein, and compensatory switching means operable simultaneously with the primary switching means to apply a compensatory pulse, equal in magnitude to the extinguishing pulse but of opposite sense, to selected ones of the conductors extending along the other co-ordinate of the array to cause discharges in the lamps connected thereto and common to both conductors to be retained.

3,942,072

METHOD AND SYSTEM FOR MAINTAINING AN ELECTRICALLY NEUTRAL ATMOSPHERE

Robert H. Best, and William D. Harris, both of Greensboro, N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed Oct. 18, 1974, Ser. No. 516,199
Int. Cl.² F24F 3/12
U.S. Cl. 317—4 20 Claims

1. A system for maintaining a predetermined electrical atmosphere in an area into which air is at least periodically pumped comprising:

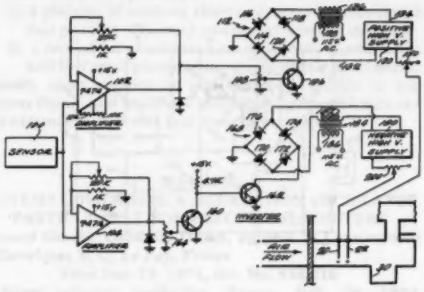
a first electrical grid,

a second electrical grid,

means for mounting said first and second grids in spaced apart relation at a location wherein the air pumped into said area passes through each of said grids sequentially and is charged electrically as a function of the amplitude and polarity of the voltage on said first and second grids respectively,

sensor means for detecting the magnitude and polarity of the electric field within said area and producing a control signal varying as a function of the detected magnitude and polarity, and

circuit means connected to said sensor means for receiving said control signal and applying voltages to said first and second grids respectively, the voltage applied to one of said grids being negative and the voltage applied to the other grid being positive, said circuit means varying the applied voltages so as to alter the detected field to a



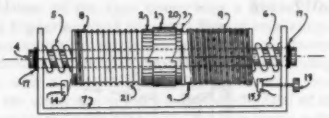
predetermined condition by producing in the air passing through said grids a net number of ions of a polarity required to produce said predetermined condition in said area, said circuit means further applying voltages of opposite polarity respectively to said first and second grids simultaneously for at least a certain range of detected electric field magnitude.

3,942,073

MOTOR OPERATED GARAGE DOOR MECHANISM

Florian Lafontaine, 10747 Hotel de Ville, Montreal Nord, Quebec, Canada

Filed Mar. 21, 1975, Ser. No. 560,623
Int. Cl.² E05F *15/12*
U.S. Cl. 317—6 **1 Claim**



1. A motor operated garage door mechanism used to arrest the opening movement of a garage door should the door encounter an obstacle on its way up or to reverse its closing movement should the door encounter an obstacle on its way down, comprising, in combination:

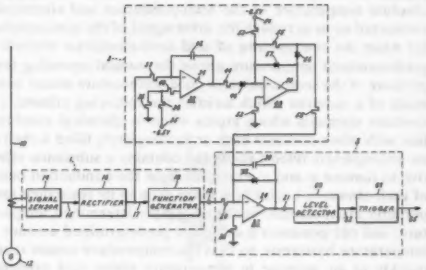
a housing; a shaft rotatively mounted in said housing; key means provided to prevent lateral movement of said shaft in said housing; a collar fixedly received on said shaft, said collar having a given rotational speed being driven by an electric reversing motor, said collar having protuding slants at opposite ends; two cylinders adjacent to said collar, said cylinders slidably received on said shaft and having protuding slants interlocking with the slants of said collar, said cylinders having a rotational speed proportioned to the given rotational speed of said collar, said cylinders having an external thread type spiral grooves; cable door closer actuating means operating in said grooves; a pair of adjustable limit switch means electrically connected to said motor and each oppositely disposed in a region adjacent to the extremities of said cylinders, said pair of limit switch means including a first limit switch for stopping said motor from rotating said collar and a second limit switch for causing said motor to reverse the rotation of said collar; a pair of compression springs means axially mounted on said shaft and disposed thereon on each side of said cylinders maintening said cylinders in working engagement with said collar, said cylinders being independently and longitudinally slidable on said shaft when the rotational speed of said cylinders varies from the given rotational speed of said collar whereby said pair of spring means allow one of the said cylinders when the rotational speed of said one cylinder differs from the given rotational speed of said collar to contact said first limit switch to stop the rotation of said collar when said one cylinder slides longitudinally away from said collar in one direction on said shaft and allow the other of the said cylinders when the rotational speed of said other cylinder differs from the given rotational speed of said collar to contact said second limit switch to reverse the rotation of said collar when said other cylinder slides longitudinally away from said collar in the other direction on said shaft.

3,942,074

STATIC OVERCURRENT RELAY

Daniel J. Graham, Marlton, N.J., assignor to General Electric Company, Philadelphia, Pa.

Filed Sept. 27, 1974, Ser. No. 509,879
Int. Cl.² H02H *3/08, 7/06*
U.S. Cl. 317—36 TD **11 Claims**



1. A protective relay adapted to be coupled to an electric current circuit including electrical apparatus in order to protect said apparatus from overheating comprising:

a. means for deriving from said circuit an input signal representative of the heating effect which a current in said circuit has on said apparatus;

b. normally reset integrating means having an input terminal to which said input signal is suplied and an output terminal at which is developed an output signal having a magnitude that increases with time when the integrating means is operative;

c. control means for enabling said integrating means to operate whenever the magnitude of said current exceeds a predetermined pick-up level, and for resetting said integrating means in delayed response to said current subsiding below said pick-up level, the time delay resetting action reducing said output signal at a predetermined substantially linear rate toward a quiescent magnitude near zero; and, thereby approximating the cooling characteristic of said electrical apparatus

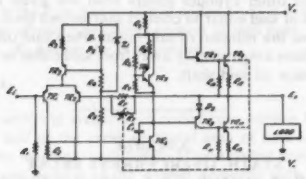
d. means connected to said integrating means capable of producing a trip signal when said output signal exceeds a preselected magnitude.

3,942,075

SEMI-CONDUCTOR THERMAL PROTECTION ARRANGEMENT

Richard I. Maran, Cote St. Luc, Canada, and Robert S. Meijer, Chicago, Ill., assignors to Multi-State Devices Ltd., Dorval, Canada

Filed May 6, 1974, Ser. No. 467,594
Claims priority, application Canada, Apr. 19, 1974, 197818
Int. Cl.² H02H 5/04
U.S. Cl. 317—41 **10 Claims**



1. A semi-conductor protection arrangement for use with class AB, B or C power amplifiers or in any other circuit configuration wherein a reduction in drive signal at a stage prior to that of the protected semi-conductor results in a lessening of the protected semi-conductor dissipation, said arrangement comprising a temperature sensor thermally coupled with the protected semi-conductor for detecting the absolute temperature of the semi-conductor and electrically connected so as to reduce the drive signal of the semi-conductor when the temperature of said semi-conductor exceeds a predetermined temperature above the normal operating temperature of the semi-conductor, said temperature sensor being made of a material which satisfies the following criteria: (a) contains elements whose atoms when in chemical combination with other elements have an incompletely filled d-shell or an incompletely filled f-shell; (b) contains a substance effective to remove s- and p- electrons from the conduction bands of such atoms; (c) exhibits a sharp drop in its resistance-temperature characteristic at the above predetermined temperature; and (d) possesses a sufficient predetermined amount of temperature hysteresis, so that the temperature sensor reacts quickly to an increase in temperature above said predetermined temperature but reacts at a slower rate for minor temperature excursions in the transition region thus preventing thermal oscillation of the semi-conductor protection arrangement within the transition region.

3,942,076

PHOTOGRAPHIC REMOTE SLAVE FLASH APPARATUS

Seymour Ellin, Chestnut Hill, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 26, 1973, Ser. No. 428,456
Int. Cl.² H05B 37/02
U.S. Cl. 317—80 **7 Claims**

1. Apparatus adapted for use with a source of electrical energy for igniting a select flashlamp within a linear array thereof in substantial synchronism with the illumination of a scene from another transient source of illumination, comprising:

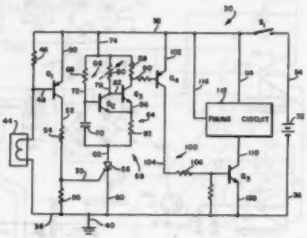
means for mounting said array in an orientation for illuminating said scene from said select flashlamp and including terminal means electrically connectable in igniting relationship with said flashlamps;

firing circuit means for electrically activating the said terminal means associated with said select flashlamp in response to energization by a select input condition;

light detecting network means for providing a select output condition responsive to illumination from said transient source;

timing circuit means responsive to said light detecting network means select output condition and converting from a first output condition to a second output condition at a predetermined interval of time from its response to said light detecting network means output condition; and

means responsive to said timing means first output condition for deriving said firing means select input condition



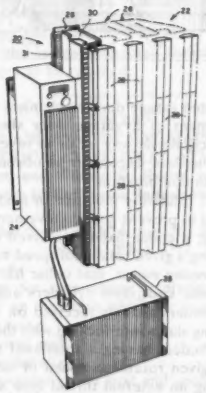
so as to effect said electrical activation of said terminal means and responsive to said timing means second output condition for removing said firing means select input condition after said predetermined interval of time thereby facilitating the protection of said firing circuit means from damage occassioned from too long a period of energization by said select input condition.

3,942,077

MODULAR PANEL CONSTRUCTION FOR PROGRAMMABLE CONTROLLER AND FRAME THEREFORE

Howard A. Powers, Medfield, Mass., assignor to Modicon Corporation, Andover, Mass.

Filed Apr. 11, 1974, Ser. No. 460,037
Int. Cl.² H02B 1/04
U.S. Cl. 317—118 **11 Claims**



1. An input/output panel assembly interconnected with a central processor to form a machine controller interconnected with and operating external devices, comprising:

A. a support frame;

B. a terminal strip secured to said support frame at a first location and incorporating a set of contact pins communicating with said external devices;

C. a panel board

a. removably mounted to said support frame at a second location,
b. electrically interconnectable with adjacent panel boards,
c. incorporating a first set of pin-receiving means, and
d. communicating with the central processor; and

D. an electronic module removably mounted to said support frame and incorporating
a. a plurality of contacts electrically interconnected with said plurality of contact pins of said terminal strip, and
b. a second set of contact pins electrically connected to said first set of pin-receiving means of said panel board,

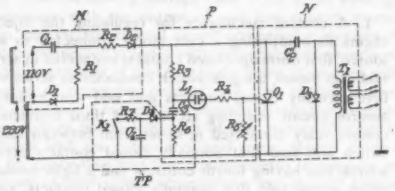
whereby upon insertion of said electronic module in said support frame, said module is electrically connected between said external devices and said central processor.

3,942,078

SYSTEMS COMPRISING A RELAXATION OSCILLATOR PARTICULARLY FOR ELECTRICAL IGNITERS

Bernard Simeau, Chadrac, France, assignor to Constructions Electriques R.V., Le Puy, France

Filed Dec. 19, 1974, Ser. No. 534,210
Claims priority, application France, Feb. 20, 1974, 74.05765
Int. Cl.² H05B 37/02
U.S. Cl. 317—142 R **9 Claims**



1. A system of the type comprising a thyristor having a threshold triggering level triggered from a relaxation oscillator, in particular an electrical igniter for gas burners, the improvement wherein said relaxation oscillator comprises a capacitor and a neon tube connected thereto, means for charging the capacitor to the ionization potential of the neon tube, whereby the neon tube conducts and forms a discharge current path for said capacitor, means for providing said discharge current to said thyristor as a triggering pulse, and electronic means for gradually decreasing the intensity of the triggering pulses supplied by the oscillator to an intensity below the threshold triggering level of the thyristor while maintaining the capacitor charging current, whereby triggering automatically stops after a predetermined time while the relaxation oscillator continues to oscillate.

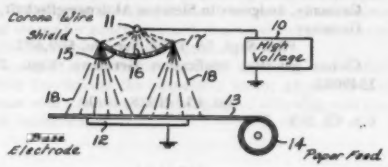
3,942,079

CHARGING OF ELECTROPHOTOGRAPHIC SURFACES

Alan J. Brock, 26 Strangways Terrace, North Adelaide, Australia (5006)

Filed Oct. 27, 1971, Ser. No. 192,915
Claims priority, application Australia, Oct. 29, 1970, 3023/70; Oct. 29, 1970, 3024/70; Dec. 7, 1970, 3423/70
Int. Cl.² H01T 19/00
U.S. Cl. 317—262 A **7 Claims**

1. The method of charging surfaces which comprises producing a corona between a corona-producing member and a base electrode, causing corona components to be deflected by an isolated interposed insulator or semi-conductive member to the area where the charge is to be applied, and positioning a member which is to be charged directly in the area of the deflected corona whereby the corona passes at least over the insulator or semi-conductor surface, the shield being formed of an insulator or semi-conductor taken from the group cellulose acetate, polyvinyl alcohol, polyvinyl buteral, polyvinyl vinylidene, or polyvinyl polychloride.

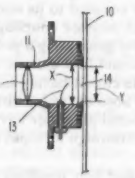


3,942,080

METHOD AND APPARATUS FOR APPLYING A UNIFORM ELECTROSTATIC CHARGE TO ELECTROPHOTOGRAPHIC FILM

Stephen Mark Milewski, Holyoke, Mass., assignor to Scott Paper Company, Philadelphia, Pa.

Filed Apr. 5, 1974, Ser. No. 458,236
Int. Cl.² G03G 13/02
U.S. Cl. 317—262 A **6 Claims**



1. Apparatus for applying a uniform electrostatic charge to a predetermined portion of an electrophotographic film, comprising:
means for grounding the electrophotographic film;
a lens module having an opening for charging and imaging the film, the opening being formed by a mask which confines charging of the film to the opening area, each area dimension of the opening being larger than one third of the corresponding dimension within the lens module;
a corona discharge electrode positioned within the lens module at a distance from about .2 to about 2.0 inches from the film when the film is placed against the module opening;
a high voltage AC potential source connected to the electrode and having a potential greater than the corona threshold potential of the electrode; and
a high voltage DC potential source connected to the electrode in series with the AC potential source for biasing the AC potential source, the DC potential source being less than the difference between the voltage of the AC potential source and the corona threshold potential of the electrode.

3,942,081

WINDING AND RE-WINDING APPARATUS USING A D.C. MOTOR WITH AN ELECTRONIC COMMUTATION DEVICE

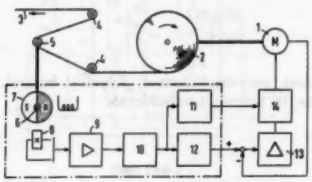
Manfred Liska, and Johann Grünleitner, both of Nurnberg, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Sept. 26, 1974, Ser. No. 509,682

Claims priority, application Germany, Sept. 28, 1973, 2349003

Int. Cl.[2] H02K *29/00*

U.S. Cl. 318—7 1 Claim



1. In apparatus for winding and unwinding material to and from a spool and in which the winding or unwinding tension of the material is measured by a position sensing device, the improvement comprising:

a. a brushless D.C. motor mechanically driving the spool;

b. an electronic commutation device for energizing the stator windings of the brushless D.C. motor;

c. means for converting the tension sensed by the position sensing device into a first electrical signal;

d. a comparator comprising an operational amplifier having an input resistor coupled to its non-inverting input and a positive feedback resistor coupling its output to its non-inverting input for generating a polarity signal having the same polarity as said first electric signal;

e. an absolute value circuit having said first electrical signal as an input said absolute value circuit comprising:

1. a first operational amplifier having said first electrical signal coupled through an input resistor to its inverting terminal;

2. a first diode and first feedback resistor in series coupling the output of said amplifier to said inverting input, said diode having a polarity such as to feedback negative signals;

3. a second circuit feedback circuit comprising a second diode and second resistor coupling said output to said converting input said diode arranged to feedback positive signals;

4. a second operational amplifier having its inverting input coupled through an input resistor to said first electrical signal;

5. a second input resistor coupling a junction of one of said diodes and feedback resistors to said second amplifier inverting input; and

6. a third feedback resistor coupling the output of said second amplifier to its inverting input;

f. means for generating a speed signal proportional to the speed of the motor;

g. means for generating an error signal, said means having as inputs said speed signal and the output of said absolute value circuit; and

h. means for applying said polarity signal and the output of said means for generating an error signal to said electronic commutation device for energizing the stator windings of said D.C. motor in a sequence depending on said polarity signal and with an amplitude proportional to said error signal.

3,942,082

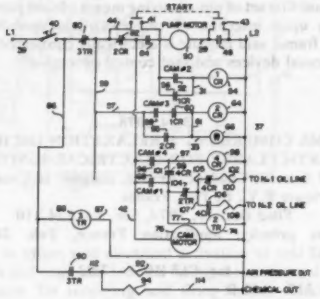
MULTI-LINE CHEMICAL INJECTION SYSTEM

Thomas D. Hadnagy, 17 Briar Lane, Roslyn Heights, N.Y. 11577

Filed June 24, 1974, Ser. No. 482,432

Int. Cl.[2] H05B *3/02*

U.S. Cl. 318—51 2 Claims



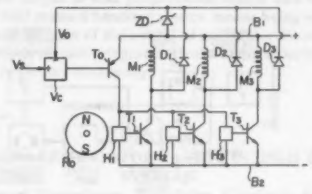
1. A control mechanism for regulating the injection of chemicals comprising a cam motor connected to a power source, first normally closed contacts connected in series with said cam motor, a toggle switch connected in series with said first normally closed contacts and said cam motor, a first control circuit including second and third contacts, and a control relay connected in series from between said toggle switch and said first normally closed contacts across said source and having fourth contacts and a light connected in series across said first normally closed contacts, said third contacts, and said control relay, and additionally having a conductor connected from between said light and said fourth contacts to between said control relay and said third contacts, a second control circuit including a first push button switch, fifth contacts, and second control relay connected in series from between said toggle switch and said first normally closed contacts to first control circuit side and across said source, and having sixth contacts connected across said fifth contacts, a pressure control circuit including seventh contacts, a pump motor, eight contacts connected in series from said first normally closed contacts and across said power source, and having a second push button switch connected across said eight contacts, and a solenoid valve circuit including ninth normally open contacts and a control relay connected in series across said cam motor, a parallel circuit combination including tenth normally closed contacts, a first solenoid coil connected in series with said tenth normally closed contacts, a second solenoid coil, eleventh normally open contacts connected in series with said second solenoid coil, with said series combination of said first solenoid coil and said tenth normally closed contacts connected in parallel with said series combination of said second solenoid coil and said eleventh normally open contacts and with said parallel circuit combination connected in series with twelfth normally closed contacts, a time relay connected across said parallel circuit combination and with said twelfth normally closed contacts and thirteenth normally open contacts connected in series to said twelfth normally closed contacts and with said combination of said thirteenth normally open contacts, said twelfth normally closed contacts and said parallel circuit combination connected across said cam motor, and a fourteenth normally open contact connected from between said ninth normally open contacts and said control relay to between said twelfth normally closed contacts and said thirteenth normally open contacts.

3,942,083

BRUSHLESS MOTOR

Tadashi Takahashi, and Kazuo Onishi, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 19, 1974, Ser. No. 498,657
Claims priority, application Japan, Aug. 24, 1973, 48-94377
Int. Cl.² H02K 29/00
U.S. Cl. 318—138 14 Claims



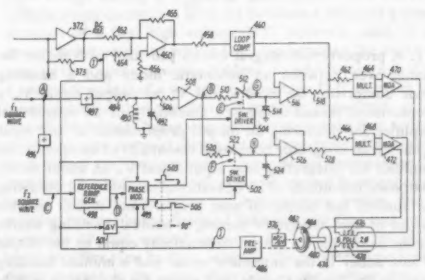
1. A brushless motor comprising a rotor with a permanent magnet, a stator with stator windings disposed around the rotor at spaced intervals, a plurality of first control means each associated with respective ones of said stator windings for producing an output in accordance with the rotational position of the rotor, and an electric control circuit for controlling a current flowing through each of the stator windings in accordance with the output of said first control means, wherein said electric control circuit comprises a plurality of transistors connected in series with respective stator windings, the control terminals of said transistors being connected with the output of respective ones of said first control means, voltage comparator means for comparing a reference voltage and the voltage induced in each of said stator windings in accordance with the rotation of said rotor, second control means for controlling said first control means in response to the output of said voltage comparator means, and bypass circuit means connected in parallel with each of said stator windings for allowing a current due to a voltage induced in each of the stator windings to flow back to the stator windings, said bypass circuit comprising a constant voltage element to eliminate a voltage level higher than the level of said voltage induced in accordance with the rotation of the rotor.

3,942,084

VIDEO TAPE RECORDER METHOD AND APPARATUS

Kenneth Louth, Menlo Park, Calif., assignor to International Video Corporation, Sunnyvale, Calif.

Continuation-in-part of Ser. No. 285,917, Sept. 1, 1972. This application May 2, 1973, Ser. No. 356,380
Int. Cl.² H02P 5/06; H02K 29/02
U.S. Cl. 318—138 3 Claims



1. A drive system for an N-pole brushless DC motor comprising

means for providing N sine wave and N cosine wave cycles in response to every motor revolution, said waves representing the mechanical pole positions of the motor, said means including means for generating a signal representing the angular position of the drive shaft of said motor and means for generating said sine wave and cosine wave cycles in response to said signal, and

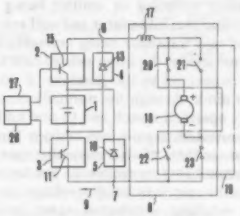
drive current means modulated by said sine and cosine waves for driving the respective motor phases of said motor with a continuous driving signal following said sine and cosine waves.

3,942,085

CONTROL APPARATUS OF DC MOTORS

Susumu Tadakuma; Junpei Inagaki, both of Yokohama, and Shigeru Tanaka, Kamakura, all of Japan, assignors to Agency of Industrial Science Technology, Tokyo, Japan

Filed Sept. 19, 1974, Ser. No. 507,352
Claims priority, application Japan, Sept. 22, 1973, 48-106525; Sept. 22, 1973, 48-106526
Int. Cl.² H02P 7/36
U.S. Cl. 318—341 8 Claims



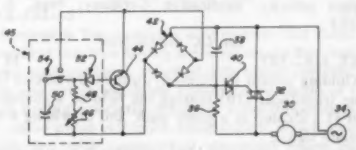
1. In control apparatus for a DC motor of the type wherein the power supplied to said motor from a direct current source of supply is controlled by the ON-OFF control of switch means, the improvement which comprises first and second switch means which are connected in series between said source and said motor, a first rectifier connected in parallel with a first series connection including said source and said first switch means, a second rectifier connected in parallel with a second series connection including said source and said second switch means, a smoothing reactor connected between said first switch means and said motor, and control means supplying said first and second switch means with control signals such that while one of said switch means is rendered ON the other switch means is rendered from ON to OFF and sequentially from OFF to ON.

3,942,086

SOLID STATE MOTOR CONTROL SYSTEM

Burt Bresler, Vernon Hills, Ill., assignor to Signode Corporation, Glenview, Ill.

Filed June 8, 1973, Ser. No. 368,331
Int. Cl.² G05B 11/16
U.S. Cl. 318—447 3 Claims



1. A solid state timing control system for regulating the operating cycle of an electric motor which comprises:

first normally non-conductive solid state switching means connected in series with said motor, said first solid state switching means precluding operation of said motor when in non-conductive state and effecting operation of said motor substantially at line voltage during entire operating cycle when in conductive state;

a resistor and a first capacitor connected in series with said motor and in parallel with said first solid state switching means, the value of said resistor being selected to limit the current passing through said resistor-capacitor circuit to preclude operation of said motor;

a second, voltage responsive solid state switching means connected between said first solid state switching means and the junction between said resistor and said first capacitor and rendering said first solid state switching means conductive in response to a predetermined voltage;

bridge rectifier means having input terminals thereof connected across said first capacitor;

a transistor having emitter and collector thereof connected across output terminals of said rectifier means;

a bias circuit including an adjustable bias resistor connected in series with a Zener diode and a second capacitor connected in parallel with said adjustable bias resistor, either said transistor collector or emitter being connected to one side of said second resistor and said second capacitor, the base of said transistor being connected to the anode of said Zener diode, the other side of said second capacitor being connected to the junction of said resistor and said Zener diode through the normally closed contacts of a manually operated switch and to said emitter or collector not connected to said bias resistor through the normally open contacts of said manually operated switch;

said bias circuit being operative to render said transistor conductive in response to the voltage across said first capacitor reaching a selected value less than a pre-selected value required to render said second voltage responsive solid state switching means conductive; said second capacitor charging in response to actuation of said manually operated switching means connecting said capacitor across said transistor collector and emitter and discharging through said adjustable bias resistor in response to de-actuation of said manually operated switching means for rendering said transistor non-conductive and connecting said capacitor across said adjustable bias resistor, thereby allowing the voltage across said first capacitor to increase to said pre-selected value to render said second voltage responsive solid state switching means conductive; said first solid state switching means being rendered conductive in response to said second solid state switching means being rendered conductive to effect operation of said motor for a selected time interval determined by the discharge time of said second capacitor.

3,942,087

TRACK SYSTEM FOR STEERED, UNTRACK VEHICLES

Wolfgang Maisch, Schwieberdingen, and Erich Rubel, Burgstall, both of Germany, assignors to Robert Bosch G.m.b.H., Gerlingen-Schillerhohe, Germany

Filed July 29, 1974, Ser. No. 492,523

Claims priority, application Germany, Sept. 3, 1973, 2344293

Int. Cl.² G05D *1/00*

U.S. Cl. 318—587 **11 Claims**

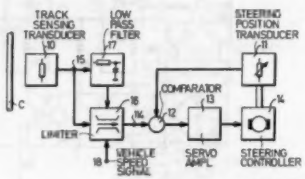
1. Guiding system for steered, untracked vehicles having a sensing transducer (10) sensing the field of a guidance conductor (C) located in a guide path, and providing a steering command signal;

a speed signal terminal (18) providing a signal representative of vehicle speed;

and servo steering means (11, 12, 13, 14) responsive to said steering command signal and providing an output steering said vehicle under command of said steering command signal,

wherein the servo steering means includes

a limiter stage (16) having the steering command signal applied thereto and connected to limit said command signal, said speed signal being connected to said limiter stage (16) to control the limiting band width or range of said limiter stage in accordance with the level of said speed signal representing different vehicle speeds; the different vehicle speeds to narrow the range of control



and hence the response range of the servo steering means at high vehicle speeds while providing for a wide range of control and hence high level, extensive response at low vehicle speeds;

and means (17) connected to and controlled by the command signal, and further connected to and controlling said limiter stage (16) to set the half, or center position of the response range, as controlled by the speed signal, of the servo steering means as a function of the command signal.

3,942,088

PROPORTIONAL-INTEGRAL CIRCUIT HAVING MEANS FOR CHANGE-OVER BETWEEN AUTOMATIC MODE AND HANDLING MODE

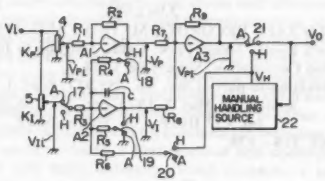
Takayuki Yosioka; Tadashi Komada; Akira Sugano, and Takafumi Fukumaru, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Sept. 3, 1974, Ser. No. 502,878

Claims priority, application Japan, Sept. 5, 1973, 48-99267

Int. Cl.² G05B *7/00*

U.S. Cl. 318—591 **4 Claims**



1. A proportional-integral circuit provided with means for change-over between an automatic mode and a handling mode comprising an input signal V_i, an output signal V_o, a proportional means composed essentially of an operational amplifier for delivering an output proportional to said input signal V_i, an integrator composed essentially of an operational amplifier for integrating said input signal V_i, an adder means composed essentially of an operational amplifier for obtaining the sum of the output of said proportional means and the output of said integrator means, a manual handling source means delivering an output substantially equal to the output of said adder in the automatic mode and a manual handling signal in the handling mode, and means for alternately switching the source of said output signal V_o between the output of said manual handling source means and said adder means, said proportional-integral circuit further comprising means for

blocking application of said input signal V_1 to said integrator means when the handling mode is selected, means for applying the output of said proportional means and the output signal of said manual handling source means to the input terminal of said operational amplifier constituting the essential part of said integrator means when the handling mode is selected, and means for connecting a resistor across the input and output terminals of said operational amplifier constituting the essential part of said integrator means when the handling mode is selected, the gain of the output of said integrator means relative to the output of said proportional means and the output signal of said manual handling source means being selected to be $1/n$, and the gain of the output of said adder means relative to the output of said integrator means being selected to be n where n is greater than unity.

3,942,089

D.C. VOLTAGE TRANSFORMATION IN HIGH TENSION SYSTEMS

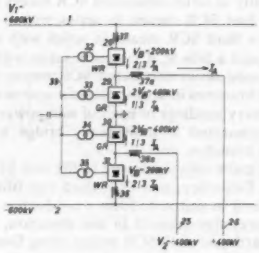
Karl Werner Kanngiesser, Viernheim, Germany, assignor to Brown, Boveri & Cie., AG, Mannheim, Germany

Filed Oct. 9, 1974, Ser. No. 513,388

Claims priority, application Germany, Oct. 10, 1973, 2350778

Int. Cl.² H02M 3/315

U.S. Cl. 321—2 **5 Claims**



1. A multiphase converter station comprising: a plurality of converter bridges, constituting at least two groups being disposed differently to ground, the A.C. sides of said bridges being connected in parallel to a three-phase current network, each bridge having a converter transformer, said converter bridges being connected in series between a first and a second terminal of a first high voltage D.C. network, each of said groups being provided with a D.C. tap between the outer and next to the outer converter bridges, to which taps a first and a second terminal of a second high voltage D.C. network with lower potential than the first network are connected, at least one of the bridges being disposed between said first terminal of said second network being an inverter-type bridge and at least one of said bridges being disposed between said second terminal of said first network and said second terminal of said second network also being an inverter-type bridge, the remaining bridges being disposed between said first and second terminals of said second network symmetrically to ground being rectifier-type bridges, wherein the inverter-type bridges direct current in the same direction as the voltage drop between the first and second terminals of the first network and the rectifier-type bridges direct current in the opposite direction.

3,942,090

CONTROL PROCESS FOR OPERATING A PARALLEL-RESONANT CIRCUIT INVERTER THAT SUPPLIES AN INDUCTIVE CHARGE, AS WELL AS THE PARALLEL-RESONANT CIRCUIT INVERTER OPERATED BY THIS METHOD

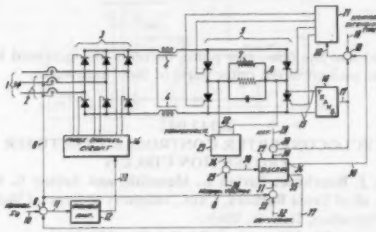
Hans Matthes, Remscheid, and Erhard Mauler, Wermelskirchen, both of Germany, assignors to AEG-Elotherm G.m.b.H., Remscheid-Hasten, Germany

Filed Sept. 18, 1974, Ser. No. 507,186

Claims priority, application Germany, Oct. 10, 1973, 2352473

Int. Cl.² H02M 5/45

U.S. Cl. 321—4 **1 Claim**



1. A method for operating a parallel-resonant circuit inverter with a rectifier, a thyristor DC/AC converter connected to this rectifier and operated with controllable frequency, which converter feeds the parallel-resonant circuit containing the inductive load, comprising the steps of

measuring of DC/AC converter voltage U, and the thyristor extinction time t_L during the operation,

controlling the DC/AC converter frequency ω to maintain the DC/AC converter voltage U constant at an operating value U_B, for a constant direct current $I_d = I_{d0}$, in a first control range characterized by a low resonant-circuit damping, and

controlling the direct current I_d for the purpose of maintaining the DC/AC voltage constant at its operating value U_B, in the case of a constant thyristor extinction time $t_L = t_{L0}$, in a second control range characterized by a high damping, as well as by transition from the first to the second control range, if t_L becomes equal to t_{L0} in the case of increasing resonant-circuit damping, and transition from the second to the first control range, if I_d become equal to I_{d0} in the case of decreasing damping.

3,942,091

METHOD AND APPARATUS FOR OPERATING A CONVERTER FED ROTATING FIELD MACHINE

Manfred Weibelzahl, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 29, 1974, Ser. No. 501,762

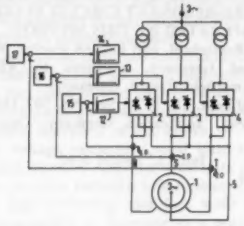
Claims priority, application Germany, Sept. 6, 1973, 2345035

Int. Cl.² H02M 7/00

U.S. Cl. 321—5 **9 Claims**

5. Apparatus for operating a converter fed three phase rotating field machine having a neutral return line, said rotating field machine being supplied with phase currents generated by converters which are controlled by means of current controls having associated reference value transmitters which form a three phase reference value system, which machine is normally fed with symmetrical sinusoidal phase currents, comprising means for generating current reference values having a waveform with a shape corresponding to the superposition of a sinusoidal fundamental and a harmonic for each

phase current such that one phase current is reduced in the central region of the half wave to a predetermined maximum



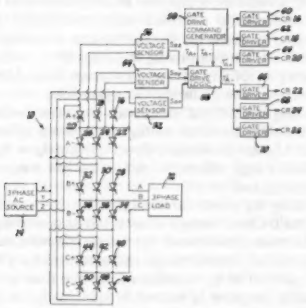
amount and the other two phase currents are increased by a certain amount in the outer parts of their half waves.

3,942,092

CYCLOCONVERTER CONTROLLED RECTIFIER PROTECTION CIRCUIT

Frank J. Bourbeau; Barton L. Meredith, and Arthur L. Witten, all of Santa Barbara, Calif., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 16, 1974, Ser. No. 532,874
Int. Cl.² H02M *1/18, 5/30*
U.S. Cl. 321—11 **3 Claims**



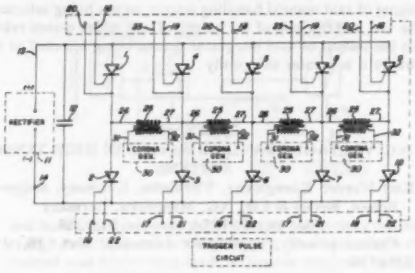
1. A gate drive circuit for a respective controlled rectifier in a cycloconverter system comprising: means for generating a gate drive command for the controlled rectifier; a voltage sensor coupled across the controlled rectifier for generating a signal representing the conduction state of the controlled rectifier; logic means having first and second inputs and first and second output states; means coupling the gate drive command to the first input; means coupling the signal representing the conduction state of the controlled rectifier to the second input, the logic means shifting its output from the first state to the second state in response to the gate drive command coupled to its first input and shifting its output from the second state to the first state in response to the signal coupled to its second input when said signal represents nonconduction of the controlled rectifier after termination of the gate drive command at its first input; means coupled to the logic means for generating a gate drive signal when the output of the logic means is in the second state; and means coupling the gate drive signal to the gate of the controlled rectifier, whereby gate drive signal is extended after termination of the gate drive command until the controlled rectifier becomes conductive to prevent turn-on of the controlled rectifier when it becomes forward blocking following termination of the gate drive signal.

3,942,093

MULTIPLE CORONA GENERATOR SYSTEM

Frank Eugene Lowther, Severna Park, Md., assignor to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. Nos. 456,396, March 29, 1974, and Ser. No. 509,016, Sept. 25, 1974. This application Dec. 10, 1974, Ser. No. 534,560
Int. Cl.² H02M *7/515*
U.S. Cl. 321—45 R **7 Claims**



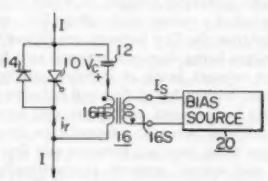
1. A corona reaction system which comprises:
a. A plurality of corona reactors, each connected to the primary winding of power transformers therefor,
b. A source of DC power,
c. A plurality of series connected SCR means comprising at least a first SCR means in series with a second SCR means, a third SCR means in series with a fourth SCR means, and a fifth SCR means in series with a sixth SCR means, said series connected SCR means connected as parallel branches in series with said source of DC power, the primary windings of each of said power transformers being connected to individually bridge a pair of said parallel branches; and
d. Trigger pulse means adapted to fire said SCR means at a desired frequency, said first, third and fifth SCR means being fired in unison to form a conductive path through said power transformers in one direction, and said second, fourth and sixth SCR means being fired in unison to form a conductive path in the opposite direction.

3,942,094

COMMUTATION CIRCUIT AND APPLICATIONS THEREOF

Masahiko Akamatsu, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 387,700, Aug. 13, 1973, abandoned, which is a continuation of Ser. No. 199,190, Nov. 16, 1971, abandoned. This application Oct. 9, 1974, Ser. No. 513,472
Int. Cl.² H02M *7/515*
U.S. Cl. 321—45 C **13 Claims**



1. A commutation circuit comprising:
semiconductor controlled rectifier means connected between a source of direct current and a load, said semicon-

ductor controlled rectifier means comprising a parallel combination of a first semiconductor controlled rectifier and a rectifier element in a reverse direction to said semiconductor controlled rectifier;

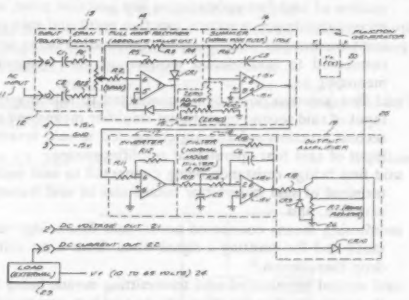
a capacitor member operatively coupled to said semiconductor controlled rectifier means to provide means for imparting a reverse bias to said semiconductor controlled rectifier means; and

a transformer member having a primary transformer winding and a secondary transformer winding, said primary winding being serially connected to said capacitor member and the sense of said windings being such that said secondary winding comprises means for biasing magnetomotive force of a reverse polarity from a magnetomotive force produced in response to reverse bias current flowing through said primary winding and for limiting said reverse bias current by means of said bias magnetomotive force during the deenergization of said semiconductor rectifier means and at least in an unsaturated state of said transformer member.

3,942,095
AC-TO-DC CONVERTER SYSTEM

Mauro Guiseppe Togneri, 7626 Westwind, Houston, Tex. 77071, and Harry Samuel Elliott, 12914 Jebbia Lane, Stafford, Tex. 77477

Filed Aug. 20, 1974, Ser. No. 498,958
Int. Cl.² H02M 7/44
U.S. Cl. 321—47 **19 Claims**



1. An AC-TO-DC Converter system for converting a variable magnitude alternating current signal input of a single predominant frequency to a variable magnitude direct current signal output, comprising:

input isolation, rectification, and filter means for isolating and rectifying and filtering such variable magnitude alternating current input signal;

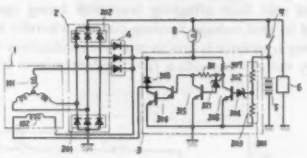
amplification means for amplifying the signal from said input isolation, rectification and filter means to the appropriate output range, said input isolation, rectification, and filter means being electrically connected between such alternating current input and said amplification means, and said amplifier means being electrically connected between said input isolation, rectification, and filter means and such directcurrent signal output; and

function and feedback means for signal shape and magnitude adjustment determined by a predefined function in the system to shape such direct current output signal and introduce it back to the input isolation, rectification, and filter means, said function and feedback means being electrically connected between the direct current signal output and said input isolation, rectification, and filter means.

3,942,096
VOLTAGE REGULATING SYSTEM

Katsumi Itoh, Ohbu, and Kazumasa Mori, Aichi, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Sept. 26, 1974, Ser. No. 509,635
Claims priority, application Japan, Oct. 1, 1973, 48-110738
Int. Cl.² H02H 7/00
U.S. Cl. 322—28 **6 Claims**



1. A voltage regulating system for an automotive vehicle comprising;

an alternating current generator having an output winding and a field winding;

a first rectifier circuit connected to said output winding;

a second rectifier circuit connected to said output winding and for providing field energizing terminals;

a storage battery connected to said first rectifier circuit;

a field energizing transistor for connecting said field winding across said field energizing terminals;

a voltage sensing circuit connected across said storage battery for providing a present level and for detecting a battery voltage in accordance with said preset level;

a control transistor connected to said voltage sensing circuit at its base and being driven into thereby a conductive state when said battery voltage exceeds said preset level, the collector-emitter path of said control transistor being connected across said field energizing terminals;

the base of said field energizing transistor being connected to the collector of said control transistor, whereby said field energizing transistor is driven into the nonconductive state when said battery voltage exceeds said preset level, by bypassing the base current thereof through said control transistor;

a protective transistor, whose collector-emitter path is connected between the base and emitter of said field energizing transistor, for bypassing the base current of said field energizing transistor; and

an over-voltage detecting means connected between the collector of said control transistor and the base of said protective transistor and for driving said protective transistor into the conductive state when the voltage across said field energizing terminals exceeds a predetermined value which is higher than said preset level.

3,942,097
VOLTAGE REGULATING SYSTEM

Katsumi Itoh, Ohbu, and Kazumasa Mori, Aichi both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Oct. 16, 1974, Ser. No. 515,246
Claims priority, application Japan, Oct. 22, 1973, 48-119335; May 6, 1974, 49-50852
Int. Cl.² H02J 7/14
U.S. Cl. 322—28 **6 Claims**

1. A voltage regulating system for an automotive vehicle comprising:

an alternating current generator having a generating winding and field winding;

a first rectifier circuit connected to said generating winding;

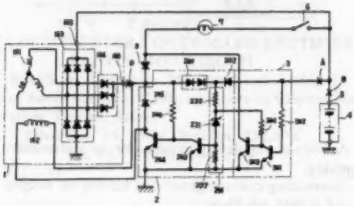
a second rectifier circuit connected to said generating winding for providing a positive field energizing terminal at its output, said field winding being connected at one of its ends to said terminal;

a storage battery connected to the output of said first rectifier circuit through a supply cable;

a field affecting transistor operatively related to said field winding for selectively completing a circuit from the terminal through said field winding;

a voltage sensing circuit connected across said battery for detecting battery voltage;

a base of said field affecting transistor being operatively related to said voltage sensing circuit, whereby said field affecting transistor is driven into nonconduction when the battery voltage exceeds a first predetermined level;



a compensating circuit connected between said positive terminal and said voltage sensing circuit, said compensating circuit being operative to drive said field affecting transistor into nonconduction when (1) the battery voltage supplied to said voltage sensing circuit is insufficient for driving said field affecting transistor into nonconduction and (2) the voltage at said positive terminal exceeds a second predetermined level;

an indicating lamp connected between said supply cable and said positive field energizing terminal; and

a lamp energizing circuit including switching means for connecting said indicating lamp between said supply cable and ground when said switching means is conductive, said switching means being connected to said positive terminal through said compensating circuit, whereby when said compensating circuit is operative, said switching means is made conductive, thus energizing said indicating lamp.

3,942,098

APPARATUS FOR GENERATING UNGROUNDED VOLTAGES

Adolf Haass, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Continuation of Ser. No. 288,286, Sept. 12, 1973, abandoned.

This application May 6, 1974, Ser. No. 467,574

Claims priority, application Germany, Sept. 27, 1971, 2148153

Int. Cl.[2] G05F 1/46

U.S. Cl. 323—23 **1 Claim**

1. Apparatus for determining the existence of a wire break in a transmission line connecting subscriber stations in a direct current, keyed data transmission system comprising:

bridge circuit means in each said subscriber station, said bridge circuit comprising four arms constituted by said transmission line, balancing resistance means and first and second bridge resistances,

transmitter means connected into one diagonal of said bridge circuit means, said transmitter means having at least first and second terminals,

receiver means connected into another diagonal of said bridge circuit,

first and second operational amplifier means, each having an inverting input and a non-inverting input and an output,

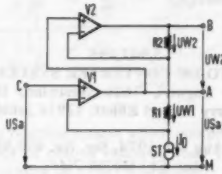
a first terminal of said transmitter means being connected to said noninverting input of said first operataonal amplifier means,

said output of said first operational amplifier means being connected to said transmission line and to said noninverting input of said second operational amplifier means,

a constant current source,

first and second resistances,

said output of said second operational amplifier means being connected to an end of said balancing resistance means, said end being connected to said output terminal of said second operational amplifier means and then to said transmission line, said output of said operational



amplifier means being further connected to a series connection of said first resistance, a first junction point, said second resistance, a second junction point and said constant current source, said series combination being series connected to said second terminal of said transmitter means,

said first junction point being connected to said inverting input of said second operational amplifier means and said second junction point being connected to said inverting input of said first operational amplifier means,

said first bridge resistance being connected to said second terminal of said transmitter means and to said transmission line, and

monitoring means connected across said first bridge resistance and for emitting a signal when there is no voltage drop thereacross,

said second terminal of said transmitting means being further connected to the connecting point between said first and second bridge resistances.

3,942,099

MEASURING TRANSFORMER WITH A CAPACITOR BUSHING

Hans-Joachim Freygang, Berlin, Germany, and Gabor Kovacs, Vienna, Austria, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed May 17, 1974, Ser. No. 470,907

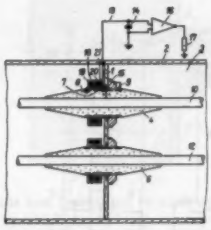
Claims priority, application Germany, May 17, 1973, 2325440

Int. Cl.[2] H01F 27/06; H01B 9/06

U.S. Cl. 323—44 R **6 Claims**

1. In a high-voltage, fluid-insulated switching installation having a metal enclosure and containing a plurality of high-voltage conductors, the metal enclosure including at least one metal bulkhead for dividing the metal enclosure into separate compartments and extending transverse to the conductors, a measuring transformer arrangement comprising: a plurality of feedthrough bushings mounted in the bulkhead and corresponding to respective ones of the high-voltage conductors for accommodating the same at the bulkhead; a plurality of voltage detection devices for detecting the voltage on corresponding ones of the high-voltage conductors, each of said voltage

detection devices including capacitor means disposed in the bushing associated with the corresponding high-voltage conductor; and a plurality of current detection devices for detecting the current in corresponding ones of the high-voltage conductors, each of the current detection devices including a



transformer unit arranged on the outer surface of the bushing associated with the corresponding high-voltage conductor, each of said current transformer units including a current transformer core, and a secondary winding system mounted on said core.

3,942,100

ADJUSTABLE REACTIVE POWER COMPENSATOR FOR A TRANSMISSION LINE

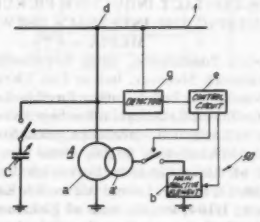
Josef Käuferle, Oberrohrdorf, and Konrad Reichert, Wettingen, both of Switzerland, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Mar. 12, 1974, Ser. No. 450,296

Claims priority, application Switzerland, Mar. 14, 1973, 3691/73

Int. Cl.² H02J *3/18*

U.S. Cl. 323—106 **11 Claims**



5. A reactive power compensator for a transmission line, comprising a shunt reactor having a first winding connected across the line for varying the electrical conditions across the line, control means responsive to the conditions across the line for varying the reactance of said shunt reactor, characterized in that said control means includes a second winding inductively coupled to said first winding a power drawing element coupled to the second winding, and a control circuit responsive to the electrical conditions of the line and coupled to the power drawing element for varying the impedance of the element so as to draw power from the second winding through the element and thereby change the reactance of the shunt reactor.

3,942,101

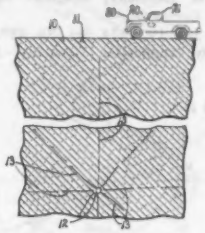
METHOD FOR LOCATING AND EVALUATING GEOTHERMAL SOURCES OF ENERGY BY SENSING ELECTROSTATIC VOLTAGE GRADIENTS

Wayne L. Sayer, 2851 N. Inyo St., Bakersfield, Calif. 93305, and Pat Wright, 6209 Hartman Ave., Bakersfield, Calif. 93309

Filed Dec. 6, 1973, Ser. No. 422,319

Int. Cl.² G01V *3/08*; G01R *5/28*; G01N *27/60*

U.S. Cl. 324—1 **10 Claims**



1. A method of locating subterranean sources of geothermal energy wherein electrostatic voltage gradients are present at the earth's surface which correspond to the heat emanating from said geothermal sources, comprising traversing an area on the surface of the earth to be examined for geothermal sources, during such traversal sensing the magnitudes of the electrostatic voltage gradients traversed, comparing the magnitudes of the electrostatic voltage gradients sensed to determine those of the greatest magnitude, and locating a source of geothermal energy by determining the positions of the voltage gradients of the greatest magnitude in the area traversed.

3,942,102

SPARK IGNITED COMBUSTION ENGINE ANALYZER

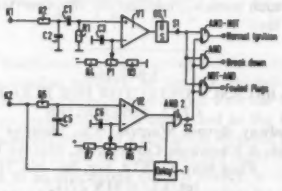
Klaus Roland Kuhn, and Viktor Stigler, both of Karlsruhe, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed May 21, 1974, Ser. No. 471,906

Claims priority, application Germany, May 25, 1973, 2326839

Int. Cl.² G01R *13/42*

U.S. Cl. 324—16 R **7 Claims**



1. An analyzer for the firing voltage curve in an internal combustion engine having a spark plug ignition system including an ignition coil with a tap on its high voltage side comprising:

a. a first means having a first input terminal for coupling to the tap on the high voltage side of the ignition coil for detecting the trailing edge of the starting voltage line having a slope greater than a first predetermined value and providing an output indicative thereof;

b. second means having a second input terminal for coupling to said high voltage tap for detecting a burning voltage whose average value is less then a second predetermined value and providing an output indicative thereof; and

c. logic means having as inputs the output of said first and second means for decoding said output to provide a final output indicating the type of ignition occurring.

3,942,103
ARRANGEMENT FOR THE TESTING OF HIGH VOLTAGE DIRECT CURRENT SWITCHES

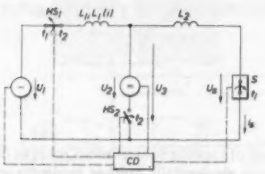
Dieter Kind, Braunschweig, and Harald Brumshagen, Wolfenbuttel, both of Germany, assignors to Dieter Kind, Braunschweig, Germany

Filed July 19, 1974, Ser. No. 489,901

Claims priority, application Germany, July 19, 1973, 2336713

Int. Cl.² G01R *31/02*

U.S. Cl. 324—28 R **6 Claims**



1. In a circuit for the synthetic testing of a high voltage direct current switch, which arrangement includes a first direct voltage source having a high current and low voltage output, a first auxiliary switch and a first inductance both connected in series with the source, with the series arrangement of the source, first auxiliary switch and inductance being arranged for connection in series with the switch to be tested, an auxiliary voltage source having a low current and high voltage output arranged to be connected to the switch for stressing the switch to be tested to its voltage breakdown level, the improvement comprising: a second inductance connected to said auxiliary voltage source and arranged to be connected in series between said auxiliary source and the switch to be tested; a second auxiliary switch connected in series with said auxiliary voltage source and arranged for operatively connecting said auxiliary voltage source across the switch to be tested; and control means connected to said second auxiliary switch and arranged for connection to the switch to be tested for closing said second auxiliary switch in order to connect said auxiliary voltage source across the switch to be tested at a time after the opening of such switch and before the current through such switch, supplied by the first voltage source, drops to zero.

3,942,104
CELL BALANCE DETECTOR FOR ELECTROLYTIC CELL ASSEMBLIES

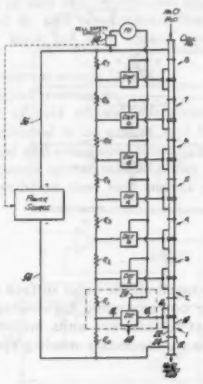
Paul Bradway Byrne, Warren, N.J., assignor to Engelhard Minerals & Chemicals Corporation, Murray Hill, N.J.

Filed May 3, 1974, Ser. No. 466,715

Int. Cl.² G01N *27/42*

U.S. Cl. 324—30 R **8 Claims**

1. A sodium hypochlorite cell voltage balance detector assembly comprising a pair of input terminals adapted to be connected to a DC source of potential, first and second arms connected in parallel with each other between said pair of input terminals, said first arm comprising a plurality of serially connected cells whereby adjacent cells are connected together at cell junctions and each cell has a normal voltage drop thereacross when the cell is operating properly, said second arm comprising a plurality of serially connected impedances in one-to-one correspondence with said plurality of cells and wherein adjacent impedances are connected together at impedance junctions, each one of said plurality of impedances being associated with a respective one of said plurality of cells and having a value such that the voltage drop across the impedance is equal to the normal voltage drop across said associated cell, detecting means connected between an impedance junction and the corresponding cell junction and responsive to voltage variations between the junctions to which said detecting means is connected for producing an imbalance signal, said detecting means comprising first amplifying means connected between said impedance



junction and said corresponding cell junction for producing said imbalance signal when said cell voltage drop increases above said cell normal voltage drop, second amplifying means connected between said impedance junction and said corresponding cell junction for producing said imbalance signal when said cell voltage drop decreased below said cell normal voltage drop, meter means for monitoring said imbalance signal, and control means responsive to a predetermined value of said imbalance signal for disconnecting the source of potential from said plurality of cells.

3,942,105
NON-CONTACT INDUCTIVE PICKUP FOR DETERMINING THE INTERFACE BETWEEN TWO MEDIA

Oleg Petrovich Bondarenko, ulitsa Kreschatik, 15, kv, 36; Boris Izrailevich Medovar, bulvar Lesi Ukrainki, 2, kv. 8; Nikolai Vasilievich Podola, ulitsa Pushkinskaya, 8, kv. 12; Anatoly Iosifovich Kravchuk, ulitsa Semashko, 10, kv. 54/4; Alexandr Mikhailovich Marchenko, ulitsa Stroitelei, 17, kv. 18; Vitaly Mikhailovich Baglai, ulitsa Semashko, 10, kv. 54/3, all of Kiev; Alexandr Borisovich Vernik, prospekt Lenina, 30/13, kv. 66; Leonid Alexeevich Kamensky, ulitsa Sovetskaya, 1/104, kv. 61, both of Elektrostal Moskovskoi oblasti; Vasily Ivanovich Us, ulitsa Saksaganskogo, 58, kv. 12, Kiev; Vladislav Konstantinovich Mokhnach, ulitsa Bereznyakovskaya, 14, kv. 236, Kiev, and Georgy Grigorievich Andrianov, bulvar Lenina, 30, kv. 26, Kiev, all of U.S.S.R.

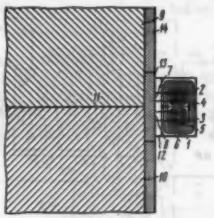
Continuation of Ser. No. 418,037, Nov. 21, 1973, abandoned. This application Oct. 3, 1974, Ser. No. 511,798

Int. Cl.² G01R *33/00*

U.S. Cl. 324—34 R **7 Claims**

1. A non-contact inductive pickup for determining the interface between two media which have different specific density and different specific resistance, at least one of the media being electrically conductive and non-magnetic, said pickup comprising: two open U-shaped magnetic circuits, said open U-shaped magnetic circuits being disposed in separate planes parallel to each other, the legs of said open U-shaped magnetic circuits being pointed in the direction of the interface between the two media when said pickup is mounted for determining said interface, an excitation winding means em-

bracing said open U-shaped magnetic circuits for providing a magnetic flux in said two magnetic circuits in the same direction upon application of an AC voltage to the input terminals thereof, and measuring windings embracing said U-shaped



magnetic circuits and connected to each other for producing opposing emf's, which emf's vary during operation of the pickup to provide a determination of the interface between the two media.

3,942,106
VOLTAGE TRANSFORMER FOR USE IN HIGH VOLTAGE SWITCHING INSTALLATION

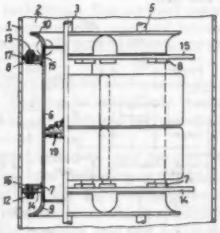
Wolfgang Hermstein, Nurnberg, and Heinz Schiemann, Berlin, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed May 17, 1974, Ser. No. 470,982

Claims priority, application Germany, May 17, 1973, 2325447

Int. Cl.² H01F 27/00; H01B 9/06

U.S. Cl. 323—44 R **16 Claims**



1. A voltage transformer for use in a gas insulated or liquid insulated high voltage switching installation having a metal encapsulation enclosing a plurality of conductors comprising:

a. a plurality of tubes with at least one tube surrounding each conductor, each of said tubes being conductive at least on the surface facing its respective conductors;

b. means connecting the tubes together and attaching them to the metal encapsulation so as to be insulated with respect to each other and the metal encapsulation; whereby each tube together with its respective conductor disposed within it will form a high potential capacitor which can be coupled to a low potential capacitor to form a voltage divider permitting measurement of the voltage on the associated conductor.

3,942,107
METHOD AND APPARATUS EMPLOYING THIN CONDUCTIVE FILMS ON FLEXIBLE NONCONDUCTIVE SHEETS FOR NON-DESTRUCTIVE MEASUREMENT OF ELECTRICAL CHARACTERISTICS

Allen Robert Gerhard, Whitehall, Pa., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Aug. 26, 1974, Ser. No. 500,799

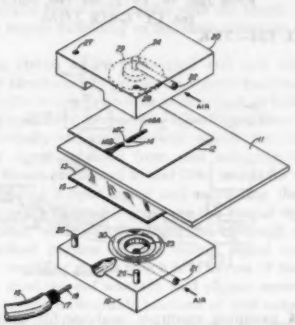
Int. Cl.² G01R 27/26, 27/06

U.S. Cl. 324—57 Q **9 Claims**

1. A method for measuring an electrical characteristic of a material comprising the steps of:

pressing with fluid pressure applied and distributed against a first nonconductive flexible sheet having a first conductive pattern adhered thereto into intimate but releasable contact with a portion of the surface of the material;

pressing with fluid pressure applied and distributed against



a second nonconductive flexible sheet having a second conductive pattern adhered thereto into intimate but releasable contact with another portion of the surface of the material;

applying an electrical signal between the two patterns; and

sensing the effect of the material on the signal.

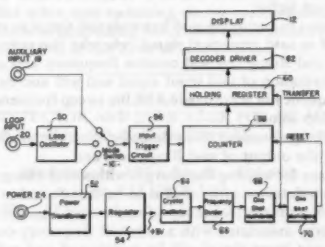
3,942,108
DIGITAL TEST INSTRUMENT

Thomas R. Potter, Los Alamitos, Calif., assignor to Indicator Controls Corporation, Gardena, Calif.

Filed Sept. 3, 1974, Ser. No. 503,038

Int. Cl.² G01R 27/26

U.S. Cl. 324—59 **3 Claims**

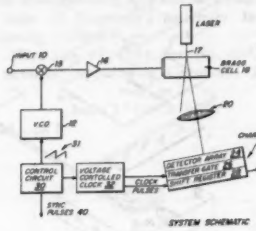


1. A test instrument for measuring the inductance of a resonant loop/lead-in network, or the like, including: a first input terminal to be connected in circuit with the loop/lead-in network; an oscillator circuit connected to the first input terminal to generate pulses of a repetition frequency near the resonant frequency of the network; a second input terminal to be connected to an alternating current source; a verification circuit connected to said second input terminal for producing verification oscillations of a known frequency; a mode selector switch having first and second terminals respectively connected to the oscillator circuit and to the verification circuit and having a common terminal to be selectively connected to its first and second terminals; a counter connected to the common terminal of said mode selector switch; a holding register connected to the counter; display means connected to the holding register for displaying the contents of the holding register; and a reference circuit connected to the counter and to the holding register for applying a reference pulse thereto at the end of each of a succession of predetermined time intervals to cause the contents of the counter to be transferred to the holding register and to cause the counter to be reset at the end of each such predetermined time interval.

3,942,109
SWEEPING SPECTRUM ANALYZER

Charles B. Crumly, Palo Alto, and John P. Lindley, Redwood City, both of Calif., assignors to Itek Corporation, Lexington, Mass.

Filed Jan. 10, 1975, Ser. No. 540,183
Int. Cl.² G01R 23/16
U.S. Cl. 324—77 K **8 Claims**



SYSTEM SCHEMATIC

1. A sweeping spectrum analyzer for analyzing the frequency components of an input signal, and having both high resolution and high sensitivity and comprising:

a. a Bragg cell means for deflecting a light beam travelling through the cell in accordance with an acoustical signal applied to the cell with the amplitude of the deflected beam being proportional to the amplitude of the acoustical signal and the angle of deflection of the deflected beam being proportional to the frequency of the acoustical signal;

b. means for producing a variable frequency sweep signal;

c. means for mixing said variable frequency sweep signal with the input signal to be analyzed to produce a heterodyned signal which contains frequency and amplitude information of the input signal and which is also swept in frequency in accordance with the sweep frequency of said sweep signal;

d. means for coupling said heterodyned signal to said Bragg cell as said acoustical signal, whereby the output signals of said Bragg cell will contain frequency and amplitude information of said input signal and will also be swept in frequency in accordance with the sweep frequency of said sweep signal;

e. a charge coupled photodetector array means for detecting the output of said Bragg cell; and

f. means for causing the charges within said charge coupled photodetector array means to be transferred in synchronism with the frequency of said sweep signal so that the energy associated with a constant frequency component of said input signal will be transferred and collected as one charge packet as it is transferred through said charge coupled photodetector array means.

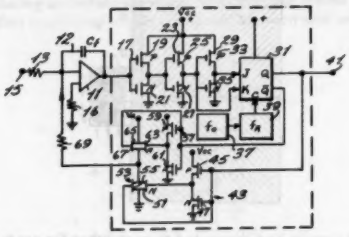
3,942,110
ANALOG TO PULSE RATE CONVERTER

Miran Milkovic, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 8, 1974, Ser. No. 467,889
Int. Cl.² G01R 7/00, 11/32
U.S. Cl. 324—142 **15 Claims**

1. In an apparatus for metering active electrical energy in a polyphase system including means for generating an analog voltage having a magnitude which is proportional to the average power of said system, the improvement comprising:

an analog to pulse rate converter for converting said average power proportional analog voltage to an output pulse train having a frequency which is proportional to the magnitude of said analog voltage, said converter including means for integrating said analog voltage, means for detecting when the magnitude of said integrated signal reaches a predetermined threshold level, the integrating interval until said threshold level is reached being directly proportional to the magnitude of said input voltage, pulse generating means responsive to said detecting means for generating a pulse each time said integrated signal reaches said threshold level, and means responsive to said pulse generating means for



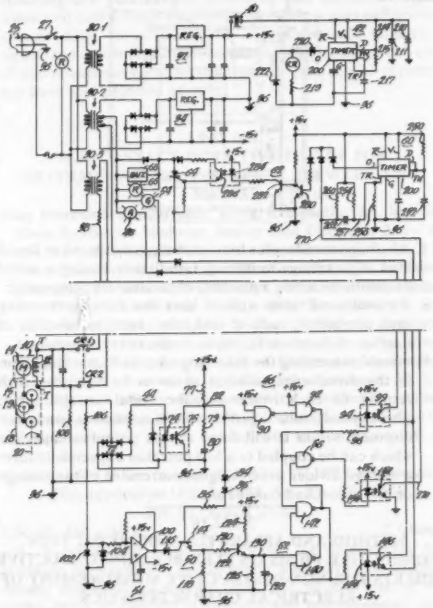
resetting said integrator to a reference level, said integrator being reset within a predetermined time interval wherein the frequency of the pulses generated by said pulse generating means is proportional to the mangitude of said power proportional analog voltage; and

means for counting said pulses.

3,942,111
METHOD AND APPARATUS FOR TESTING ELECTRIC MOTORS

John Richard Pfouts, Mount Victory, Ohio, assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Nov. 18, 1974, Ser. No. 524,493
Int. Cl.² G01R 31/02
U.S. Cl. 324—158 MG **28 Claims**



1. A method of testing an electric motor having a residual magnetic field such that upon de-energization of the running motor an EMF is produced in the windings of the motor, said method comprising the steps of: effecting a single manipulation of a control member to a test position; causing a series of preselected short time duration energizations and de-energizations of the motor as a result of said single manipulation of the

control member, said de-energization having a time duration of preselected length; selectively causing an indication of the presence of said EMF during each de-energization of the motor; and causing the control member to go to a nontest position subsequent to a preselected number of said series of energizations and deenergizations having taken place.

3,942,112

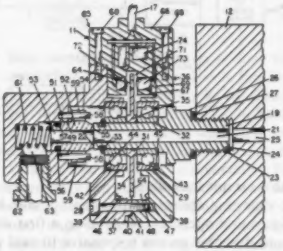
ROTARY SEAL SHAFT ROTATION TRANSDUCER

Carl M. Westbrook, 719 N. Hill Road, Beloit, Wis. 53511

Filed May 6, 1974, Ser. No. 467,476

Int. Cl.² G01P *3/48, 3/36*

U.S. Cl. 324—166 **9 Claims**



1. A rotary seal shaft rotation transducer device comprising

a. a spindle member adapted to be affixed coaxially to an end of a rotatable shaft for rotation therewith, said spindle member including a first internal passageway in leak tight communication with a second internal passageway in said shaft when said spindle member is affixed thereto;

b. a housing;

c. bearing means carried by said spindle member and supporting said housing to allow said housing to remain stationary while said shaft and said spindle member rotate together;

d. a seal member carried by said housing in nonrotatable relation thereto and including a third internal passageway, said seal member being adapted to cooperate with said spindle member to establish substantially leak tight communication between said first and third internal passageways;

e. rotatable armature means supported by said spindle member for rotation therewith; and

f. transducer means supported by said housing in non-rotatable relation thereto and adapted to cooperate with said armature means to provide an output signal functionally related to rotational movement of said spindle member.

3,942,113

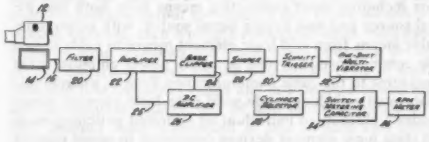
REMOTE ENGINE SPEED INDICATOR SYSTEM

James A. Wilson, Vergennes, Vt., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed June 5, 1974, Ser. No. 476,573

Int. Cl.² G01P *3/48*

U.S. Cl. 324—170 **14 Claims**



1. A system for remotely indicating the speed of a spark ignited engine in a vehicle, comprising in combination:

a. inductive means of predetermined length constructed and arranged to have high response to ignition signals comprising low frequency radio frequency signals produced by the ignition system of the vehicle engine and having a signal to noise ratio of at least 3:1, and located substantially centrally below said engine with the length of said inductive means extending in the same direction as said engine;

b. electronic circuit means connected with said inductive means for electronically processing signals received from said inductive means to provide at its output an indication of the engine's RPM, comprising input signal filter means for substantially reducing spurious signals contained in the input signal received from said inductive means, amplifier means connected to said filter means for receiving the filtered output signal and increasing the level thereof, clipper means for receiving the output signal of said amplifier means and passing therethrough only a predetermined portion of said output signal received from said amplifier means which is in excess of the average input level thereof whereby said clipper means substantially rejects undesirable portions of said output signal from said amplifier means which are contained in the portion thereof which does not pass therethrough, said clipper means producing output DC voltage and pulse signals, automatic gain control means connected with the output of said clipper means for feeding back DC voltage signals to said amplifier for controlling the amplification of said amplifier means in accordance with the signal level of said DC output voltage signals from said clipper means, and trigger circuit means operably connected for receiving at least part of the output signal of said clipper means and to switching circuit means having first conducting and second non-conducting modes of operation, said trigger circuit means being actuated upon receipt of predetermined pulse signals for causing said switching circuit means to assume said first conducting mode, and meter means connected with said switching circuit means so that when said switching circuit means assumes said second non-conducting mode said meter means provides an indication of the RPM of said engine.

3,942,114

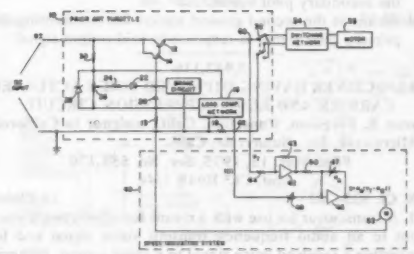
SPEED DETECTOR AND INDICATOR FOR DC MOTORS

William E. Keeling, 302 Bethesda Drive SE., Huntsville, Ala. 35803

Filed Oct. 15, 1974, Ser. No. 514,694

Int. Cl.² G01P *3/46*

U.S. Cl. 324—177 **7 Claims**



1. In a motor control system having a motor for variable speed operation and a voltage throttle circuit for driving the motor, the improvement comprising: first and second amplifiers each having an input and an output, the output of said first amplifier being coupled to the input of said second amplifier, a first resistive means coupled between the output and the input of said second amplifier for providing adjustable feedback, an indicator circuit coupled to the output of said second

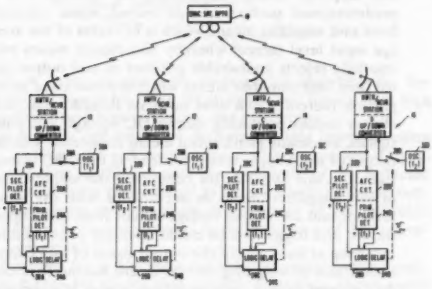
amplifier for responding to any output signal therefrom, the inputs of said first and second amplifiers being coupled to said motor throttle circuit for receiving the input signals therefrom for providing an output signal indicative of motor speed, and a second resistive means coupled between the input of said second amplifier and said motor throttle circuit for providing an adjustable signal thereto.

3,942,115

DUAL PILOT REDUNDANT AFC SYSTEM FOR SATELLITE COMMUNICATIONS SYSTEM

Chester Joseph Wolejsza, Jr., Gaithersburg, Md., assignor to Communications Satellite Corporation (COMSAT), Washington, D.C.

Filed Oct. 31, 1973, Ser. No. 411,541
Int. Cl.[2] H04B *7/20*
U.S. Cl. 325—4 **11 Claims**



1. In a satellite communications system including a plurality of ground stations for transmitting and receiving signals within a designated communications band, a satellite repeater for receiving all transmitted signals and retransmitting them back to all ground stations, and means at a first ground station for transmitting a primary pilot signal for implementing an automatic frequency control function at all ground stations, the improvements comprising:

a. means at a third ground station for transmitting a secondary pilot signal,

b. means at a second ground station for monitoring the presence of the primary and secondary pilot signals,

c. means at the second ground station responsive to the monitoring means for generating an output signal in response to the loss of reception of the primary pilot signal for a predetermined time and the continuing reception of the secondary pilot signal, and

d. means at the second ground station for transmitting the primary pilot signal in response to said output signal.

3,942,116

TRANSCEIVER HAVING IMPROVED VOICE ACTUATED CARRIER AND ECHO SUPPRESSION CIRCUIT

Myron E. Ferguson, Cupertino, Calif., assignor to California Microwave, Inc., Sunnyvale, Calif.

Filed Mar. 13, 1975, Ser. No. 558,170
Int. Cl.[2] H04B *1/44*
U.S. Cl. 325—22 **12 Claims**

1. A transceiver for use with a means for converting a voice input to an audio frequency transmit voice signal and for converting a received voice signal to a voice output, comprising:

a transmit circuit including,

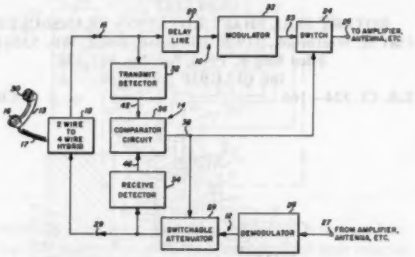
signal delay means for delaying the transmit voice signal for a predetermined period of time, signal modulating means for converting the delayed transmit voice signal to a corresponding radio frequency signal, and

first means responsive to a control signal and operative to selectively cause said radio frequency signal to be transmitted;

a receive circuit including,

signal demodulating means for converting the received radio frequency signal to an audio frequency received voice signal,

second means responsive to said control signal and operative to selectively attenuate said received voice signal; and



a control circuit including,

first detector means responsive to said transmit voice signal and operative to develop a first detected signal,

second detector means responsive to said received voice signal and operative to develop a second detected signal, and

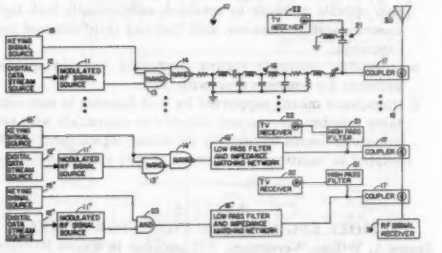
signal comparing means responsive to said first and second detected signals and operative to generate said control signal when said first and second detected signals have a predetermined relationship.

3,942,117

ALL SATURATED SWITCHING MODE SOLID STATE RF AMPLIFIER

Paul M. Cunningham, Richardson, Tex., assignor to Spectradyne, Inc., Richardson, Tex.

Filed Dec. 17, 1973, Ser. No. 425,253
Int. Cl.[2] H04L *27/04;* **H03K** *19/36*
U.S. Cl. 325—161 **3 Claims**

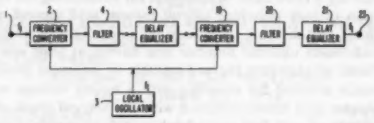


1. In an RF signal cable communications system: an RF signal source; a keying signal source; all saturated switching mode solid state logic element means having a plurality of inputs including input connective means from both said RF signal source and said keying signal source; with output connective means from said logic element means to cable in said cable communication system as an RF power amplifier stage transmitting to the cable communication system; wherein said all saturated switching mode solid state logic element means includes a plurality of individual all saturated switching mode solid state logic element devices connected in series cascade at an RF transmitter location; and with keying signal being fed through connective means from said keying signal source as half of dual inputs to said logic element devices.

3,942,118
DELAY TIME CONTROLLER FOR USE IN A GROUP-DELAY EQUALIZER

Haruo Shiki, Tokyo, Japan, assignor to Nippon Electric Company Limited, Tokyo, Japan

Filed Sept. 30, 1974, Ser. No. 510,196
Claims priority, application Japan, Oct. 1, 1973, 48-110816
Int. Cl.² H04B *1/06*
U.S. Cl. 325—303 **8 Claims**

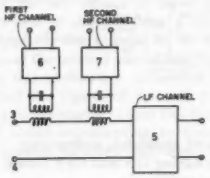


1. A delay time controller comprising a first frequency converter for converting an input signal in a first frequency band into a signal in a second frequency band, a second frequency converter for converting said signal in said second frequency band into another signal in said first frequency band, a variable-frequency local oscillator connected in common to said first and second frequency converters, a first delay equalizer connected between said first and second frequency converters whose frequency response versus delay time has a slope over a broad range in said second frequency band, and a second delay equalizer inserted in a signal path of said signal in said first frequency band whose frequency response versus delay time within a desired range in said first frequency band is of such nature as to offset said slope of said frequency response of said first delay equalizer over said second frequency band.

3,942,119
MULTIPLE-TRANSMISSION-CHANNEL ACTIVE ANTENNA ARRANGEMENT

Hans Heinrich Meinke, Gauting; Heinz Lindenmeier, Planegg; Fritz Landstorfer, and Gerhard Flachenecker, both of Munich, all of Germany, assignors to Hans Kolbe & Co., Bad Salzdetfurth, Germany

Filed Feb. 27, 1974, Ser. No. 446,533
Claims priority, application Germany, Mar. 2, 1973, 2310616
Int. Cl.² H04B *1/18;* **H01Q** *1/50*
U.S. Cl. 325—308 **24 Claims**

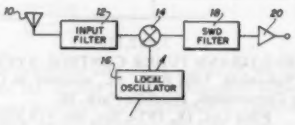


1. An active antenna arrangement comprising, in combination, a passive antenna structure having two output terminals and operative for receiving electromagnetic radiation and converting the same into electrical signals appearing across said two antenna output terminals; a first and a second transmission channel, each having a respective input comprised of a pair of input terminals and respectively operative for transmitting electrical signals having frequencies lying in a predetermined first frequency range and in a predetermined higher second frequency range, one of said input terminals of said first channel being connected to one of said two antenna output terminals; and transformer means comprising primary winding means connecting the other of said input terminals of said first channel to the other of said two antenna output terminals, secondary winding means connected across said two input terminals of said second transmission channel, and means forming a resonance at one of said frequency with one of said winding means said transformer means being operative when the frequency of the electrical signal across said antenna output terminals is in said first range for stepping down the input impedance of said second channel as reflected into the circuit of said primary winding means to a value lower than the value of the input impedance of said first transmission channel at such frequency.

3,942,120
SWD FM RECEIVER CIRCUIT

Ronald E. Ham, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed July 22, 1974, Ser. No. 490,475
Int. Cl.² H04B *1/26*
U.S. Cl. 325—344 **4 Claims**

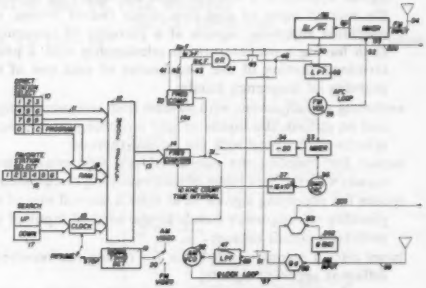


1. An FM tuner for feeding an IF section of a receiver circuit which comprises:
   a. an antenna signal input circuit including a broad band pass input filter having an essentially flat response to signals in the 88 to 108 mHz FM broadcast band,
   b. a mixer connected to receive the signal from said input circuit,
   c. a variable local oscillator connected to said mixer operating for high side injection to produce an IF signal centered within the radio astronomy listening band of 73 to 74.6 mHz and an image frequency displaced outside the response of said input filter, and
   d. an SWD filter connected to the output of said mixer having a narrow pass band of 300 kHz centered at the frequency of said IF signal, the output of said SWD filter being the IF output of said tuner.

3,942,121
DIGITAL TUNING METHOD AND SYSTEM

David B. Bell, and John A. Cipher, both of Garland, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sept. 9, 1974, Ser. No. 504,642
Int. Cl.² H04B *1/16*
U.S. Cl. 325—419 **11 Claims**



1. A digital tuning system which comprises:
   a. means to store a received digital code representative of the frequency of a selected broadcast channel,
   b. variable frequency oscillator means,

c. means receiving the output of said variable frequency oscillator and generating a digital count representative of the frequency of said variable frequency oscillator,

d. means receiving said digital code from said storage means and said digital count and producing a first signal when the frequency of said variable frequency oscillator is less than the frequency represented by said digital code, a second signal when the frequency of said variable frequency oscillator is greater than the frequency represented by said digital code and a third signal when the frequency of said variable frequency oscillator is equaled to the frequency represented by said digital code,

e. means receiving said first and second signals and varying the frequency of said variable frequency oscillator toward the frequency of said selected channel in response thereto, and

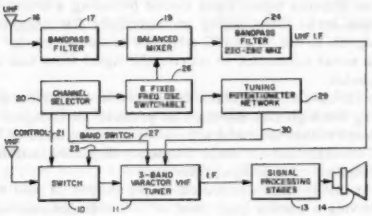
f. means receiving said third signal and applying to said variable frequency oscillator a signal independent of said digital count causing said variable frequency oscillator to maintain an output frequency equal to the frequency of said selected channel.

3,942,122

MULTIBAND TUNER CONTROL SYSTEM

Mutsuo Nakanishi, Villa Park, Ill., assignor to Quasar Electronics Corporation, Franklin Park, Ill.

Filed Oct. 15, 1974, Ser. No. 514,650
Int. Cl.[2] H04B 1/16
U.S. Cl. 325—459 6 Claims



1. A tuning control system for a wave signal receiver capable of receiving signals from different stations in a plurality of frequency bands including in combination:

first mixer circuit means with first and second inputs and an output;

means for supplying signals in one of said plurality of frequency bands to the first input of said first mixer circuit means;

variable frequency oscillator means responsive to control signals applied to a control input for supplying signals to the second input of said first mixer circuit means, said oscillator supplying signals at a plurality of requencies, each having a predetermined relationship with a predetermined portion of the frequencies of said one of said plurality of frequency bands;

switching circuit means with at least first and second inputs and an output, the inputs of said switching circuit means selectively coupled with the output thereof;

means for coupling the output of said first mixer circuit means with the first input of said switching circuit means;

means for supplying signals in at least a second one of said plurality of frequency bands to the second input of said switching circuit means;

tuner circuit means controllable for tuning the receiver to different received signals;

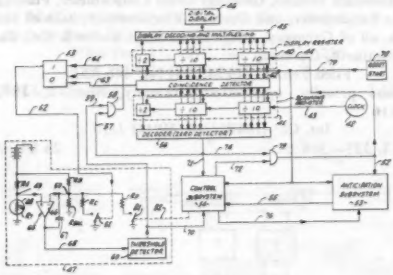
means for coupling the output of said switching circuit means with the input of said tuner circuit means; a selection circuit comprising first and second multibank switches, the first bank thereof being settable directly to the tens digits of a selected television channel number, and including a first bank of elements therein settable to different positions for supplying control signals to the control input of said variable frequency oscillator means to cause said variable frequency oscillator means to produce an output frequency uniquely related to the corresponding tens decade of the UHF television signals directly represented by the digit selected by the first bank of elements of said first multi-bank switch, said first multi-bank switch further having a second bank of elements for supplying a tuning voltage to said tuner circuit means and having a third bank of elements for controlling the operation of said switching circuit means; said second multi-bank switch being settable to the units digits of a selected television channel number and having at least one first bank of elements thereof settable to different positions, each adapted for coupling with a tuning voltage supply means and interconnected with the second bank of elements of said first multi-bank switch to supply a unique tuning voltage thereto for controlling said tuner circuit means, said second multi-bank switch further comprising second and third banks of switching elements interconnected with the third bank of elements of said first multi-bank switch for controlling said switching circuit means in accordance with the combination of settings of said first and second multi-bank switches.

3,942,123

ELECTRONIC MEASUREMENT SYSTEM

Heinz W. Georgi, La Jolla, Calif., assignor to IVAC Corporation, San Diego, Calif.

Division of Ser. No. 287,341, Sept. 8, 1972, Pat. No. 3,877,307, which is a continuation-in-part of Ser. No. 45,990, June 15, 1970, Pat. No. 3,702,076. This application July 3, 1974, Ser. No. 485,539
Int. Cl.[2] G01K 7/24
U.S. Cl. 328—1 3 Claims



1. Measurement apparatus, comprising:

switch means having ON and OFF states;

first counter means;

means for cyclically counting said first counter means;

second counter means;

means for comparing the output signals of said first and said second counter means and conditioning said switch means to one of its ON or OFF states in response to preselected relative states of said first counter means and said second counter means;

means responsive to a preselected state of said first counter means to condition said switch to the other of its ON or OFF states; and

a bridge network, wherein the state of balance of said bridge network is controlled by said switch means.

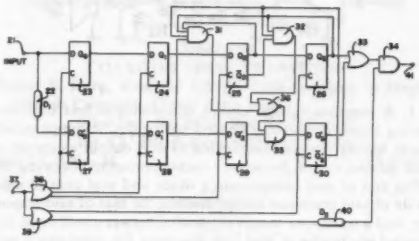
2. In a measurement system wherein electrical pulses represent a changing condition being monitored during a measurement cycle, the combination comprising:

first means for monitoring said pulses;
second means responsive to a prescribed sequence of pulse conditions to terminate said measurement cycle;
third means for monitoring the elapsed time in the measurement cycle; and
fourth means for varying said prescribed sequence of pulse conditions as a function of elapsed time.

3,942,124
PULSE SYNCHRONIZING APPARATUS AND METHOD

Zoltan Tarczy-Hornoch, 7106 Marlborough Terrace, Berkeley, Calif. 94705

Filed Dec. 26, 1973, Ser. No. 427,459
Int. Cl.² H03K *1/17, 5/13*
U.S. Cl. 328—63 **7 Claims**



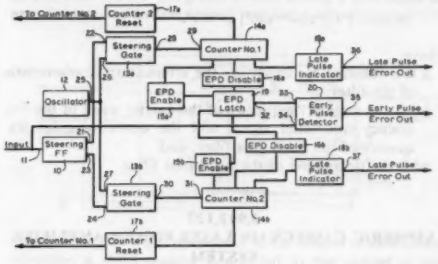
1. In a method for synchronizing input pulses to a train of clock pulses utilizing n pairs of flip-flops from first to n-th pair, where n is an integer greater than one, and wherein each flip-flop can assume one of the states of set and reset, the first step of applying said clock pulse signals to each of the n pairs of flip-flops and said input pulse signals to the first pair of flip-flops, one of the two signals of input and clock pulses being delayed to one of the flip-flops of the first pair, the second step of applying the outputs of the first pair of flip-flops to the inputs of the second pair of flip-flops, and the third step of repeating this application of outputs to inputs of the following pair until the inputs of the n-th pair are reached, thereby obtaining momentarily in said flip-flop pairs a pattern of set and reset states representing in quantized form the initial time relationship between said input and clock pulse signals.

3. In an apparatus for synchronizing input pulses an input terminal connected to an input of a first flip-flop, a delay element connected between the input terminal and an input of a second flip-flop, said first and second flip-flops forming a first pair of flip-flops, additional pairs of flip-flops up to an n-th pair consisting of odd and even numbered flip-flops with odd and even numbered inputs receiving signals from outputs of preceding odd and even numbered flip-flops respectively, a clock input terminal receiving a train of clock pulses, said clock terminal being connected to a second input of all said flip-flops, and gating means connected to at least the n-th flip-flop pair serving to generate synchronously with one of said clock pulses exactly one output pulse for every input pulse received as long as the minimum time spacing between input pulses is substantially equal or greater than the spacing between the clock pulses.

3,942,125
DIGITAL REPETITION RATE CHECK CIRCUIT

Edward M. Horiuchi, Skokie, and Jose V. Souto Martins, Arlington Heights, both of Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Jan. 8, 1975, Ser. No. 539,481
Int. Cl.² H03B *3/04*
U.S. Cl. 328—141 **10 Claims**

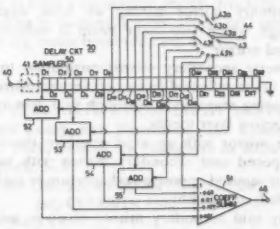


1. A pulse repetition rate check circuit of the type which detects when the second of two consecutive pulses from a pulse generator is early or late with respect to a predetermined repetition time period following the first pulse, said pulse repetition rate check circuit comprising:
an input for receiving the consecutive pulses;
a first clock coupled to said input and activated responsive to the receipt of the first pulse, said clock having a finite capacity before returning to zero time;
an early pulse detector coupled to said input for detecting the second pulse; and
a first early pulse detector enabling means coupled to said clock and to said detector for enabling said detector for a predetermined time and including an inhibit means for preventing said detector from being enabled after said detector has been once enabled; whereby,
said inhibit means will preclude said detector from once again being enabled notwithstanding a second pulse being received so late as to allow said first clock to time up to capacity and back to zero, to thereby prevent a late second pulse from being detected as an early pulse.

3,942,126
BAND-PASS FILTER FOR FREQUENCY MODULATED SIGNAL TRANSMISSION

Teruo Muraoka, Sagamihara, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

Filed Nov. 18, 1974, Ser. No. 524,818
Claims priority, application Japan, Nov. 18, 1973, 48-129475; Mar. 14, 1974, 49-28545
Int. Cl.² H04B *1/04*
U.S. Cl. 328—167 **9 Claims**



1. A band-pass filter for frequency-modulated signal transmission comprising a delay circuit comprising a plurality of

unit delay elements connected in cascade arrangement and receiving as input a signal containing a frequency-modulated signal, and a coefficient summing circuit for carrying out coefficient summing of outputs produced by specific delay elements of said delay circuit and producing as output said frequency modulated signal in band-pass filtered state, said band-pass filter having a transmission characteristic represented substantially by the equation

$$H(j\omega) = [\ 1 - a(\omega - \omega o)^2\ ]\ e^{-j\omega\tau d},$$

where:

a is a constant for imparting the attenuation characteristic of the filter;

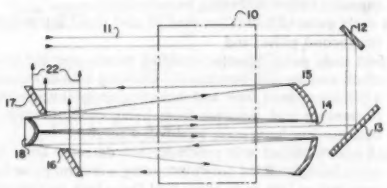
ωo is the angular frequency of the carrier wave of the frequency-modulated signal and the center angular frequency of the band-pass filter; and

τd is the delay time of the band-pass filter.

3,942,127
ASPHERIC CASSEGRAIN LASER POWER AMPLIFIER SYSTEM

Frederick R. Fluhr, Oxon Hill; Stephen T. Hanley, Temple Hill, and R. Bernard Brown, Upper Marlboro, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 11, 1975, Ser. No. 567,339
Int. Cl.² H01S 3/08
U.S. Cl. 330—4.3 **8 Claims**



1. A laser power amplifier system so positioned relative to an active laser media to redirect laser radiation through said active laser media, which comprises:

a first mirror juxtaposed said active mirror laser media which receives a laser beam subsequent to passing through said active laser media substantially perpendicular to the axis thereof and reflects said laser beam therefrom;

a second mirror for receiving said laser beam reflected from said first mirror and reflecting said laser beam back through said active laser media substantially perpendicular to the axis thereof;

an aspheric concave primary mirror positioned between said second mirror and said active laser media;

said primary mirror having an axial aperture therein through which said laser beam is reflected from said second mirror;

an aspheric secondary mirror positioned to receive said laser beam reflected from said second mirror subsequent to passing respectively through said primary mirror and said active laser media;

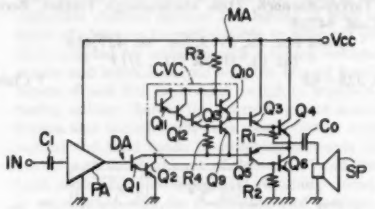
a plane mirror with an axial aperture therein positioned juxtaposed said secondary mirror with said secondary mirror secured opposite said aperture in said plane mirror coaxially therewith;

whereby said secondary mirror receives said laser beam reflected from said second mirror and reflects said laser beam back through said active laser media onto said primary mirror which reflects said laser beam back through said active laser media onto said plane mirror which reflects said laser beam as a collimated output beam.

3,942,128
CONSTANT-VOLTAGE CIRCUIT

Kunio Seki, Kodaira, and Ryozo Kontani, Hino, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 4, 1973, Ser. No. 403,405
Claims priority, application Japan, Oct. 4, 1972, 47-99011
Int. Cl.² H03F 3/04
U.S. Cl. 330—22 **15 Claims**

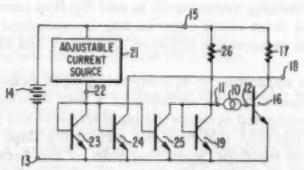


1. A constant-voltage circuit comprising a first transistor having input, output and control electrodes, a compensating diode having one end connected to said output electrode of said transistor, non-linear bias means connected between the other end of said compensating diode and said control electrode of said transistor for controlling the bias of said transistor, and a resistance means connected between said input and control electrodes of said first transistor for supplying a substantially constant current through said non-linear bias means, a constant voltage output being derived across said input and output electrodes of said transistor, wherein said non-linear bias means includes a second transistor having an output electrode connected to said other end of said diode, an input electrode connected to said control electrode of said first transistor and a control electrode, at least a pair of diodes connected in series between the output and control electrodes of said second transistor, and a voltage source connected to said other end of said diode.

3,942,129
CONTROLLED GAIN AMPLIFIER

James Robert Hall, Canoga Park, Calif., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 4, 1974, Ser. No. 520,792
Int. Cl.² H03G 3/30
U.S. Cl. 330—29 **8 Claims**



1. An amplifier, the ratio of its output signal to its input signal being responsive to a control signal, said amplifier comprising:

first and second terminals having connected therebetween a source of said input signal with a direct current conductive path therethrough;

a third terminal for application of a reference potential;

a fourth terminal for supplying said output signal;

a load direct coupled to said fourth terminal;

a first transistor being of a first conductivity type, having a base electrode connected to said first terminal, having an emitter electrode connected to said third terminal, and having a collector electrode connected to said fourth terminal;

a first controlled current source responsive to said control signal to supply a first controlled current to said second terminal;

diode means connected between said second and said third terminal and poled to conduct said first controlled current, said diode means responding to said first controlled current to develop a substantially direct offset potential thereacross, which offset potential is continually applied without substantial attenuation as quiescent base-emitter potential to said first transistor to control the flow of collector current of said first transistor; and

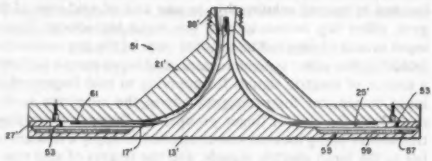
a second controlled current source responsive to said control signal for supplying a second controlled current applied to said fourth terminal to counteract changes in the quiescent component of said first transistor collector current as supplied to said load.

3,942,130

COAX-TO-RADIAL TRANSITION

Robert S. Harp, Westlake Village, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 30, 1974, Ser. No. 537,820
Int. Cl.² H01P *1/16;* **H03F** *3/54, 3/60*
U.S. Cl. 330—34 **15 Claims**



1. A transmission line transition for coupling together a coaxial transmission line and a parallel plane radial transmission line, comprising:

a lower circular plate having an upper surface of revolution generated by a smooth curve segment concave with respect to an axis of revolution and rotated about said axis, one end of said curve segment being relatively closely spaced from said axis while the other end of said curve segment being approximately parallel to a line perpendicular to said axis;

an upper circular plate having a lower surface of revolution conforming to the shape of said upper surface of said lower circular plate; and

separation means disposed between said upper and lower surfaces of revolution for maintaining a desired uniform separation distance between said surfaces and thereby defining successively a coaxial air line section, a smooth transition air line section, and a radial air line section coextensive with said plates.

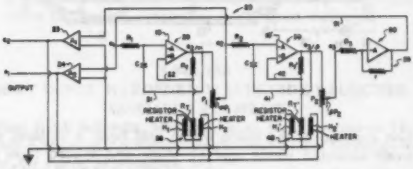
3,942,131

LOW FREQUENCY TWO PHASE OSCILLATOR INCLUDING VARIABLE FEEDBACK INTEGRATOR CIRCUITS

Allan I. Bennett, Export, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Division of Ser. No. 436,279, Jan. 24, 1974, Pat. No. 3,906,381. This application Dec. 12, 1974, Ser. No. 532,287
Int. Cl.² H03B *5/20*
U.S. Cl. 331—45 **7 Claims**

1. A two-phase low-frequency oscillator comprising first and second integrator circuits, each of said circuits including an operational amplifier having first and second input terminals and an output and including a first frequency dependent negative feedback loop connected between said first terminal and said output terminal, and a frequency independent positive feedback loop between said second input terminal and said output terminal; a first gain control means having an input connected to the output of said first operational amplifier, and an output defining a first oscillator output terminal; a second resistor connected to the output of said first gain control means, said second integrator circuit having a first input terminal connected to said second resistor; a second gain control



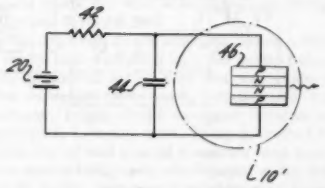
means having an input connected to the output of said second amplifier; a third resistor connected to the output of said second control means; means for changing the phase of the output of said second control means 180° connected to said third resistor, the ouput of said phase changing means defining a second oscillator output; a first resistor connected to the output of said phase changing means and to the first terminal of said first operational amplifier; and sensing means connected to each of said second feedback loops for stabilizing said oscillator against drift.

3,942,132

COMBINED ELECTRON BEAM SEMICONDUCTOR MODULATOR AND JUNCTION LASER

Mortimer H. Zinn, Elberon, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 6, 1974, Ser. No. 504,002
Int. Cl.² H01S *3/10, 3/19*
U.S. Cl. 331—94.5 H **8 Claims**



1. A pulse modulated laser comprising a semiconductor device having a portion thereof bombarded by an electron beam and a semiconductor laser diode grown on said semiconductor device to form a monolithic PNNP structure, said laser diode responding to current flowing within said semiconductor device during beam bombardment thereof.

3,942,133

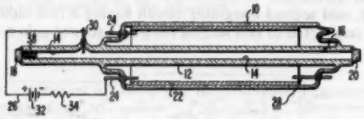
GAS LASER TUBE WITH STRAY LIGHT RESTRICTION

Robert Stephen Kutay, East Petersburg, and Kenneth Wentz Laughman, York, both of Pa., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 23, 1974, Ser. No. 517,241
Int. Cl.² H01S *3/03, 3/08*
U.S. Cl. 331—94.5 C **3 Claims**

1. A laser device for generating a beam of coherent light, said device comprising a hermetically sealed envelope, a gas filling within said envelope, a tube extending within said enve-

lope and having a bore, a different optical mirror adjacent to each end of said bore and aligned with the axis of said bore to form an optical resonator cavity within the bore, one of said mirrors being spherical for directing a cone of light along the axis of said bore toward the other one of said mirrors, an anode electrode fixed within the envelope and having a portion exposed to the space within said bore, a cathode electrode mounted within said envelope and spaced from said anode, and a coil spring pressed within said bore and having a passage therethrough positioned coaxially with said bore between said optical mirrors, said passage being smaller than said bore and larger than the cone of light directed from said spherical mirror.



3,942,134

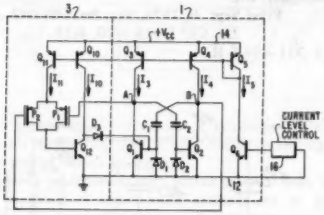
ASTABLE MULTIVIBRATOR

Otto Heinrich Schade, Jr., North Caldwell, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 3, 1974, Ser. No. 529,022

Int. Cl.² H03K 3/282

U.S. Cl. 331—113 R **9 Claims**



1. The combination comprising:

first and second transistors, each transistor having a base, an emitter, and a collector;

a first capacitor connected between the base of said first transistor and the collector of said second transistor;

a second capacitor connected between the base of said second transistor and the collector of said first transistor;

a point of fixed potential;

means connecting the emitters of said first and second transistors to said point of fixed potential;

means comprised solely of first and second current sources connected to the collectors of said first and second transistors, respectively, for alternately charging said capacitors and supplying a forward bias through the capacitors to the bases of said transistors; and

means responsive to the potentials at the collectors of said first and second transistors for applying a forward bias to one of said first and second transistors when both of said first and second transistors are nonconducting and their collector potentials are at the same level.

3,942,135

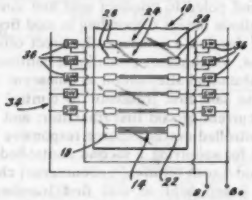
CONCATENATED SURFACE WAVE DELAY LINE CORRELATOR

Clinton H. Moor, St. Peters; Carl F. Stolwyk, and John J. Vencill, both of St. Louis, all of Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed June 12, 1974, Ser. No. 478,626

Int. Cl.² H03C 3/28; H03H 9/14

U.S. Cl. 332—11 R **16 Claims**



1. A surface wave device comprising a dielectric substrate member having a surface formed thereon over which signals are propagated, conductive means formed on said surface including a plurality of spaced conductive fingers arranged in a row of finger groups extending along said surface, the fingers extending transversely to the direction of movement of the propagated signals, means forming tap connectors to selected ones of said fingers, said tap connectors being located adjacent at least one side of said row of fingers, an input transducer formed by a plurality of spaced conductive fingers located in spaced relationship to one end of said row of fingers, other tap connectors to the input transducer fingers, input means connected to selected ones of the tap connectors including the other tap connectors, said input means including a source of electric signals for applying to said fingers of the input transducer for propagation over the substrate surface and along the row of finger groups, the fingers of said input transducer being located and controlled to apply a first encoding to the input electric signals, and the fingers of said row of finger groups being located and controlled to apply a second encoding to the encoded electric signals propagated thereby, said propagated signals being encoded according to a product of the encoding applied thereto by the fingers of the input transducer and the fingers of the row of finger groups.

3,942,136

TIME MULTIPLEX ELECTRON BEAM WITH MODULATING MEANS

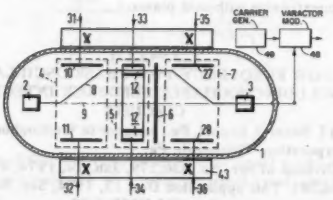
Hinrich Heynisch, Graefelfing, and Werner Veith, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed May 31, 1974, Ser. No. 475,112

Claims priority, application Germany, June 4, 1973, 2328304

Int. Cl.² H03C 3/34

U.S. Cl. 332—21 **8 Claims**



1. Multiplexing apparatus for time multiplexing a plurality of individual channels, comprising a pair of electron beam tubes, each of said tubes having an electron gun located at one end of the tube and a target disposed at the other end of the

tube, a first deflection device for deflecting the electron beam and causing said electron beam to sweep in a circle coaxial with the line between said gun and said target, a coupling arrangement interposed between said deflection device and said target, said coupling arrangement comprising a separate electrode for each of said channels distributed symmetrically about said circle, each of said electrodes being electrically connected to receive a signal corresponding to one of said individual channels for modulating the electron beam in accordance with said individual signals at one position during the circular sweep of said electron beam, a second deflection device interposed between said coupling arrangement and said target for returning the beam to a path between said electron gun and said target, and an amplifier unit interconnected between said second deflection device and the target of each of said tubes, means for connecting a carrier signal to said amplifier for producing a carrier modulated in accordance with the signals of the individual channels, means for supplying a channel signal representative of an individual channel in push-pull to corresponding electrodes of the coupling arrangements of said two tubes, and means for connecting the outputs of said amplifiers to a common terminal, said last named means including a 180° phase shifter interconnected between one of said amplifer units and said common terminal.

3,942,137
DEVICE FOR THE REMOTE ADJUSTMENT OF AN INACCESSIBLE ELEMENT

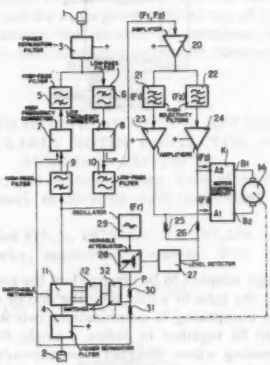
Pierre Franco, Paris, and Henri Brzozowski, Colombes, both of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Nov. 19, 1974, Ser. No. 525,116

Claims priority, application France, Nov. 28, 1973, 73.42358

Int. Cl.² H03H 7/16

U.S. Cl. 333—16 **11 Claims**



1. A device for the remote adjustment of a switchable network equipping an unattended station on a transmission line, from a terminal station on this line, comprising at the unattended station:

a switch having several contact elements, connected to said switchable network for operating the same;

a direct current motor having two possible rotating directions, for actuating said switch,

a circuit having a first input for a first remote control frequency and a second input for a second remote control frequency, said frequencies being emitted from the terminal station, said circuit having two outputs connected respectively to a first and a second terminal of said motor, said circuit operating said motor according to the presence or absence of said remote control frequencies at said inputs,

an oscillator permanently emitting a third frequency, and

means for sending back to the terminal station said third frequency, said means including an attenuation network having two attenuation coefficients and means controlling said attenuation network and connected to said switch for enabling said attenuation network to present a first attenuation coefficient when said switch is on a contact element and a second attenuation coefficient when said switch is between two contact elements.

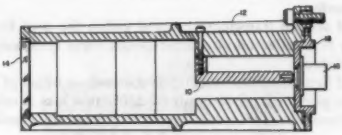
3,942,138
SHORT DEPTH HARDENED WAVEGUIDE LAUNCHER ASSEMBLY ELEMENT

William Hugh Schaedla, Medford Lakes, N.J., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 4, 1974, Ser. No. 439,666

Int. Cl.² H01P 5/08, 5/02

U.S. Cl. 333—21 R **7 Claims**



1. A short depth hardened waveguide launcher apparatus comprising in combination:

means forming a waveguide cavity having a first and second end, said first end having a coaxial connector mounted thereon, said coaxial connector having a center conductor extending within said waveguide cavity, said second end having a window mounted therein, said waveguide cavity comprising a first and second waveguide cavity, said first waveguide cavity being smaller than said second waveguide cavity, said first waveguide cavity being positioned at said first end, and

a waveguide launcher means mounted within said waveguide cavity, said waveguide launcher means being equidistantly positioned within said first waveguide cavity, said first waveguide cavity having a cavity length equal to the horizontal length of said waveguide launcher means, said waveguide launcher means being connected to center conductor of said coaxial connector said waveguide launcher means being vertically disposed within said first waveguide cavity, said center conductor of said waveguide launcher means in combination with said first cavity providing the desired match between said coax connector and free space.

3,942,139
BROADBAND MICROWAVE BULK ACOUSTIC DELAY DEVICE

Herbert Warren Cooper, Hyattsville, Md., and John deKlerk, Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 8, 1974, Ser. No. 522,070

Int. Cl.² H03H 9/26, 9/30; H01L 41/10

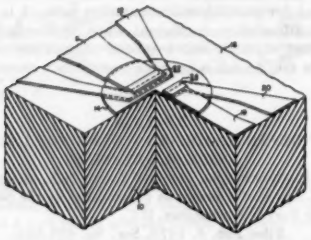
U.S. Cl. 333—30 R **19 Claims**

1. Electroacoustic apparatus comprising:

an ultrasonic transmission medium having a first and second surface,

first and second transducers adapted to convert microwave energy into bulk mode ultrasonic elastic wave energy, and vice versa, deposited on said first surface,

microwave input means connected to said first transducer,
microwave output means connected to said second transducer,
said first transducer and ultrasonic transmission medium adapted for propagation of bulk mode ultrasonic elastic wave energy in said ultrasonic transmission medium,



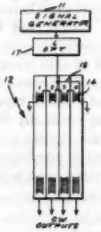
said second surface being planar and positioned to reflect ultrasonic elastic wave energy incident upon said second surface,
said second transducer located within the area incident of a first reflected ultrasonic elastic wave from said second surface,
said first transducer electrode dimensions being of such size to provide a predetermined diffraction loss at said second transducer for said first reflected ultrasonic elastic wave.

3,942,140

METHOD AND MEANS FOR COUPLING A MULTIPLICITY OF SURFACE ACOUSTIC WAVE TRANSDUCERS TO A SINGLE ELECTROMAGNETIC WAVE TRANSMISSION LINE

Kenneth R. Laker; Alan J. Budreau, both of Arlington, and Paul H. Carr, Bedford, all of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 8, 1974, Ser. No. 522,367
Int. Cl.² H03H 9/26, 9/30, 9/32; H01L 41/08
U.S. Cl. 333—72 **2 Claims**



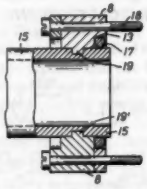
1. The method of coupling a single channel electromagnetic wave transmission line to the input transducers of a surface acoustic wave device having a multiplicity of channels and an input transducer affixed to each channel thereof comprising the steps of
determining the inductance value L that provides minimum transducer insertion loss at the center frequency of the surface acoustic wave device midband channel,
initially connecting said input transducers in all possible series, parallel and series-parallel electrical connection arrangements,
determining as a function of said inductance value L the insertion loss value for each said series, parallel and series-parallel transducer electrical connection arrangement,
determining the channel to channel insertion loss variation for each said transducer electrical connection arrangement,
selecting one of said transducer electric connection arrangements that provides minimum insertion loss consistent with prescribed multichannel surface acoustic wave device channel to channel insertion loss variation constraints, and
connecting said input transducers in said selected electrical connection arrangement to said electromagnetic wave transmission line through an inductor of said inductance value L.

3,942,141

FLANGE

Ernst Kaffenberger, Backnang, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed May 25, 1973, Ser. No. 363,853
Claims priority, application Germany, May 26, 1972, 2225556; June 24, 1972, 2231024; June 28, 1972, 2231623
Int. Cl.² H01P 1/22
U.S. Cl. 333—98 R **11 Claims**



1. A flange adapted to be arranged on the end of a tube for connecting the tube to a flange on the end of a further tube, said flange comprising in combination: two identical flange parts which fit together to define a single flange having a central opening whose periphery corresponds to the outer perimeter of a tube, each said flange part having an axial opening at least a portion of the periphery of which corresponds to the outer perimeter of the tube on which the flange is to be arranged, each said axial opening being larger in part than the outer perimeter of the tube on which said flange is to be arranged and through which the tube can pass so that each said flange part will surround the entire outer perimeter of the tube, said two flange parts fitting together in a mating arrangement along a plane transverse to the longitudinal axis of said central opening with said portion of the periphery of said axial opening of each said flange part defining a portion of the periphery of said central opening; at least one protrusion provided on the surface portion of each of said flange parts which defines a portion of said central opening for engaging a corresponding groove in a tube in a form fitting relationship; and means for connecting said flange parts together.

3,942,142
ELECTROMAGNETIC COORDINATE SELECTION DEVICE

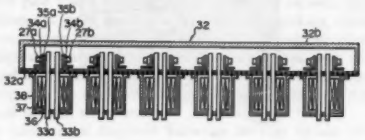
Katsuhiro Kato, Yokohama; Hideo Suzuki; Norio Yano, both of Tokyo; Yojiro Kishimoto, Tokorozawa, and Ginya Ishiguro, Tokyo, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Filed Nov. 27, 1974, Ser. No. 527,847

Claims priority, application Japan, Dec. 3, 1973, 48-134412; May 15, 1974, 49-54078; May 15, 1974, 49-54080; Oct. 21, 1974, 49-121149

Int. Cl.² H01H *67/14*

U.S. Cl. 335—112 **20 Claims**



1. An electromagnetic coordinate selection device comprising a plurality of cross point switches each provided with a stationary contact member and movable contact member and arranged in a matrix form to carry out electrical connection and disconnection between the row and column conductors, a plurality of magnetic cores disposed at points corresponding to the cross point switches to drive the movable contact members, a first coil wound about the respective magnetic cores to introduce selection current of at least one of a row and column, and a second coil wound about said magnetic cores to transmit selection current of at least one of a column and row, respectively, wherein the magnetic core is of the composite type comprising a first magnetic core member generating a sufficient amount of coercive force to latch the movable contact members and a second magnetic core member providing a larger amount of coercive force than the first magnetic core member; and the cross point switches are all sealed in at least one container, the number of containers being not greater than the number of row or column conductors.

3,942,143
ELECTROMAGNETIC SWITCHING APPARATUS, PARTICULARLY MOTOR CONTACTOR, WITH AUXILIARY CONTACTS

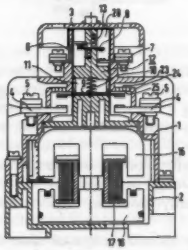
Fritz Pollmann, and Wilhelm Holzer, both of Amberg, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Feb. 6, 1975, Ser. No. 547,438

Claims priority, application Germany, Feb. 14, 1974, 2407057

Int. Cl.² H01H *67/02*

U.S. Cl. 335—132 **5 Claims**



1. An electromagnetic switching apparatus for use as a motor contactor comprising:

fixed contact members;

a contact bridge carrier having slots therein;

contact bridges held in said contact bridge carrier in tiers, one behind the other, as seen in the switching direction, said contact bridges being able to be brought into contact with said fixed contact members and being uneven in number in said tiers;

and a housing part to which said fixed contact members are attached, said housing having walls which form at least a part of the arcing chambers for the contact points of said fixed members and which extend into said slots to form labyrinths, at least one of said walls being such as to extend over only one of said tiers.

3,942,144
CONTACT HOLDER FOR AN ELECTRO-MAGNETIC CONTACTOR

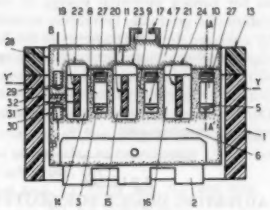
Maurice Contal, Paris, France, assignor to La Telemecanique Electrique, France

Filed Feb. 13, 1974, Ser. No. 433,691

Claims priority, application France, Jan. 19, 1973, 73.02011

Int. Cl.² H01H *67/02*

U.S. Cl. 335—132 **5 Claims**



1. A contact holder intended to move in a housing of an electro-magnetic contactor, the contact holder comprising two insulating parts which are joined together, the first part being connectable to a movable armature, and containing seatings intended to hold bridge contacts and their pressure springs, and the second part holding the bridge contacts in place by closing the seatings, characterised in that the first part is made of a material which will withstand arcing, and elongate openings are formed in the first part between the seatings intended to hold the contact elements, into which openings fit isolating partitions integral with the housing and in that these openings are blocked by the second part, which is formed from a plastics material having good antifrictional properties so as to serve as a guide.

3,942,145
SNAP-ACTION SWITCH

Bernard J. Sobczak, Chicago, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Sept. 3, 1974, Ser. No. 502,489

Int. Cl.² H01H *5/00*

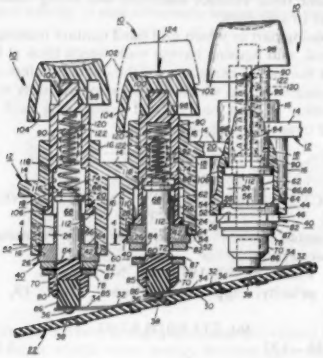
U.S. Cl. 335—188 **15 Claims**

1. An improved snap-action driver of the type which selectively moves a spring-biased workpiece from a first, normal position to a second position against the spring-bias by the urging of one end of an elongated plunger thereagainst due to the plunger's moving out of its normal position in response to a first force applied to the other end thereof, wherein the improvement comprises:

a. a stationary, ferromagnetic member having a bore slideably mounting the plunger;

b. a ferromagnetic armature fixed to the plunger for movement therewith;

c. a permanent magnet slideably mounted on the plunger, the magnet being normally attracted to, and abutting at respective interfaces, the member and the armature in a sandwich to maintain the plunger in its normal position; and



d. means for storing potential energy in response to the application of a gradually increasing second force thereto and for applying the stored energy in the force of the first force to the other plunger end until the magnetic attraction of the magnet is exceeded, and for then moving the one plunger end against the workpiece to move the workpiece to the second position; and wherein

the plunger is non-magnetic.

3,942,146

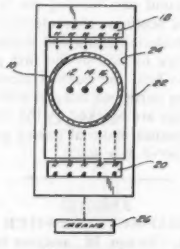
PURITY ADJUSTING DEVICE FOR SLOTTED MASK IN-LINE COLOR PICTURE TUBES

Robert La Belle, El Paso, Tex., assignor to General Instrument Corporation, Clifton, N.J.

Filed Nov. 21, 1974, Ser. No. 525,732

Int. Cl.² H01F 1/00

U.S. Cl. 335—212 **10 Claims**



1. In combination with a slotted mask cathode ray tube of the type having three electron guns located in side-by-side relationship in a plane, purity adjusting means comprising first and second magnetic field generating means, each of said means generating a magnetic field in substantially the same plane, said plane being substantially perpendicular to said gun-containing plane, and means for jointly moving said first and second magnetic field generating means between a first position wherein the net resultant field generated thereby across said gun-containing plane is zero and a second position wherein the net resultant field generated by said first and second magnetic field generating means across said gun-containing plane is greater than zero and has a substantially equal effect on each of the guns.

3,942,147

MAGNETIC BOARDS AND COMPONENTS

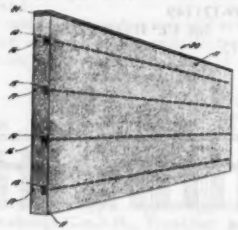
Joseph Pollack Josephson, Montreal, Canada, assignor to Visual Planning Corporation, Montreal, Canada

Filed Nov. 1, 1974, Ser. No. 520,145

Claims priority, application United Kingdom, Nov. 2, 1973, 50971/73

Int. Cl.² H01F 7/20

U.S. Cl. 335—285 **23 Claims**



1. A display device comprising a display board having an outwardly facing surface, said board being of a ferromagnetic material and having non-permanent magnetic properties, at least one flexible substrate strip, said substrate strip having permanent magnetic properties comprising at least one pair of parallel spaced apart north and south magnetic poles extending in one direction thereof, and at least one display unit having permanent magnetic properties comprising at least one pair of spaced apart north and south magnetic poles, said poles of said display unit being spaced apart by a distance equal to a multiple of the spacing of the north and south magnetic poles of the magnetic substrate strip.

3,942,148

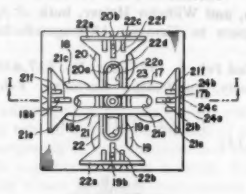
DEVICE FOR SIMULTANEOUSLY CONTROLLING A PLURALITY OF VARIABLE RESISTORS

Matsuo Nishioka, Kadoma, Japan, assignor to Matsushita Electric Industrial Company, Limited, Japan

Filed May 29, 1974, Ser. No. 474,213

Int. Cl.² H01C 9/02

U.S. Cl. 338—128 **3 Claims**



1. A device for simultaneously controlling the settings of a plurality of variable resistors, comprising:

a case having a top wall with an aperture therethrough; an electrically insulative bottom wall, and a pair of opposed side walls;

a control shaft pivotally mounted on said top wall and extending through said aperture into said case;

means pivotally mounting said control shaft on said top wall;

a first and a second elongated slide each having an elongated guide slot extending longitudinally thereof, said slides disposed within said case and disposed perpendicular to each other;

an interlocking member having an axial bore and disposed extending through the respective guide slots of said slides with said control shaft extending into said bore, said interlocking member being dimensioned to slidably fit within said guide slots to permit said interlocking member to move longitudinally of said slides within said guide slots, said axial bore extending through said interlocking member and having a diameter dimensioned for receiving said control shaft and having a minimum diameter at an intermediate position within said bore and an increasing diameter in directions along said bore away from said intermediate position to permit movement of said interlocking member when said control shaft is pivoted thereby to displace said slides;

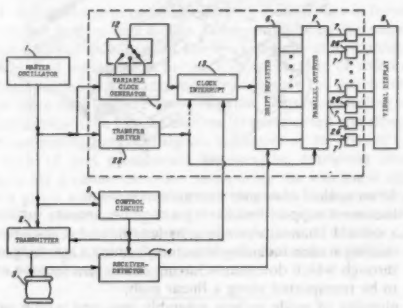
a first pair and a second pair of generally arcuate resistive elements each having a terminal for making electrical connection thereto, said first pair of resistive elements disposed on said bottom wall adjacent opposite ends of said first slide and said second pair of resistive elements disposed on said bottom wall adjacent opposite ends of said second slide; and

four cams each disposed between an end of one of said slides and the one of said resistive elements adjacent the end of one of said slides, each of said cams being mounted for rotation on said bottom wall and having a contactor for making electrical contact with an adjacent one of said resistive elements upon rotation, and each cam having means engaging the end of the respective one of said slides adjacent thereto for effecting rotation of said cams upon movement of said slides thereby to move said contactors along said resistive elements.

3,942,149
SOLID STATE DEPTH SOUNDER

Wilmer J. Westfall, Jr., Farmers Branch, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 19, 1974, Ser. No. 498,801
Int. Cl.² G01S 9/68, 7/60
U.S. Cl. 340—3 R 23 Claims



1. A system for measuring depth, said system comprising:

a. means for producing high frequency sound impulses and periodically transmitting said impulses through the water at predetermined time intervals;

b. means for receiving high frequency sound impulses reflected from a number of reflecting objects;

c. means for producing return signals which are each coincident in time to one of said reflected high frequency sound impulses and are analog values directly related to the strength of said reflected high frequency sound impulses;

d. means for producing desired clock frequencies;

e. means for measuring the time elapsed between transmission of the high frequency sound impulse and the reception of the reflected sound impulse, said means comprising:

i. a shift register device having a serial input and a specified number of bits through which an analog signal appearing at said input may be shifted at a rate related to the clock frequency;

ii. means for applying said analog return signal or signals to the input of said shift register, said analog return signal or signals being shifted serially through said shift register for timing reference;

iii. means to sample, upon the occurrence of a specified transfer signal, the individual bits of the shift register device and produce analog output signals corresponding to the bit or bits in which a pulse was found and corresponding to the analog values of said pulses, whereby said output signals have an analog value directly related to the strength of said reflected high frequency sound impulses;

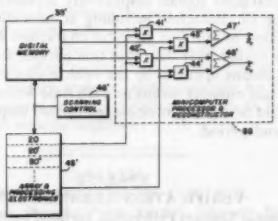
iv. means for producing said transfer signal periodically at desired time intervals, said transfer signal having a specified duration; and

f. an analog display output means capable of producing a visual display from the analog output signals of the time delay measurement means, said display being calibrated to indicate depth to the reflecting objects, and said display output means being further capable of indicating the relative strength of the reflected high frequency sound impulses.

3,942,150
CORRECTION OF SPATIAL NON-UNIFORMITIES IN SONAR, RADAR, AND HOLOGRAPHIC ACOUSTIC IMAGING SYSTEMS

Newell O. Booth; Benjamin A. Saltzer; James V. Thorn, and Jerry L. Sutton, all of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 12, 1974, Ser. No. 496,599
Int. Cl.² G01S 9/66
U.S. Cl. 340—5 H 14 Claims



1. A signal processing method for correction of spatial nonuniformities in a radiation holographic imaging system having a sensor array comprising, in combination, the strips of;

impinging said sensor array with a plane wavefront;

measuring the output of the individual sensors in the array in response to the plane wavefront;

processing the measured output plane wave signals of the individual transducers, and recording the processed output as a retrievable correction signal;

placing the imaging system in an operational environment;

receiving radiated signals from said operational environment to generate temporal signals within the sensor array;

combining individual signals generated in the sensor array by said radiated signals and recorded correction signals to obtain a corrected signal; and

processing the corrected signal to obtain an image.

3,942,151
DEVICE FOR PREVENTING DRUNKEN DRIVING OF VEHICLE

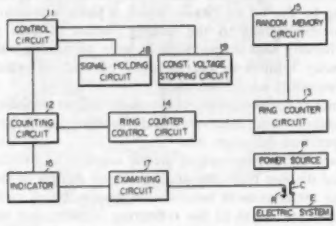
Yasuhisa Takeuchi, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Japan

Filed Oct. 10, 1973, Ser. No. 405,139

Claims priority, application Japan, Oct. 14, 1972, 47-103018

Int. Cl.² B60R *25/04*

U.S. Cl. 340—53 **7 Claims**



1. A vehicle operation inhibitor control system for a vehicle having an engine, an electric power source and an electric system for controlling the engine operation when energized by said electric power source, wherein said inhibitor control system comprises:

connect means for connecting said electric power source to said electric system when said connect means is energized;

a display having a single screen for displaying a character on the single screen in response to a character signal applied thereto when said display is triggered by an external trigger signal;

control means for consecutively applying a first group of character signals respectively representing a first group of characters different from one another to said display while applying a trigger signal to said display during a first time period, and applying to said display a second group of character signals respectively representing a second group of characters including at least one character in addition to said first group of characters during a second time period later than said first period; and

detect means operable by the vehicle operator for energizing said connect means at each time when one character of said first group is displayed by said display during said second period.

3,942,152
VERIFICATION ARRANGEMENT

Georg Gustaf Lennart Pettersson, Jarfalla, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

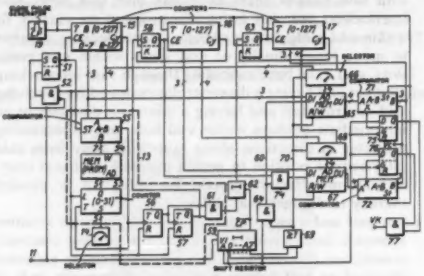
Filed Nov. 11, 1974, Ser. No. 522,622

Claims priority, application Sweden, Nov. 22, 1973, 7315808

Int. Cl.² H04L *7/00;* **G01S** *9/00*

U.S. Cl. 340—146.1 D **7 Claims**

1. Arrangement for verification that a received sequence of signal pulses includes a certain pulse pattern consisting of N signal pulses distributed in a determined manner in time comprising a code pulse source for local production of said pulse pattern in response to a received signal pulse, a group of N-1 time measuring circuits which are arranged to be started by each one of the N-1 first locally produced pulses and a further time measuring circuit which is arranged to be started by the Nth locally produced pulse, memory means for storing the measuring values from said group of time measuring circuits during an initial part of each incoming signal pulse, and for reading the measuring values thus stored at least during the later part of each signal pulse, and, means for comparing the measuring values thus stored with the measuring values of the further time measuring circuit, and means for emitting a verification signal when the last mentioned time measuring circuit



reaches a measuring value which is found in all the memory means.

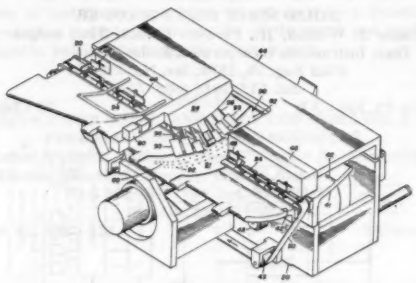
3,942,153
DOCUMENT TRANSPORT AND SCANNING SYSTEM FOR OPTICAL CHARACTER RECOGNITION

Jack E. Balko, Grand Prairie; John E. Blair, Richardson; Jerry L. Bybee; William F. Fuhrmeister, both of Dallas, and Richard T. Kushmaul, Irving, all of Tex., assignors to Recognition Equipment Incorporated, Irving, Tex.

Continuation of Ser. No. 166,736, July 28, 1971, abandoned. This application Mar. 25, 1974, Ser. No. 454,268

Int. Cl.² G06K *9/04*

U.S. Cl. 340—146.3 F **15 Claims**



4. In an optical character recognition system;

a document support bed having a concave arcuate surface, a central channel extending its length, and a document reading station including structure forming a scanning arc through which documents having characters thereon are to be transported along a linear path;

a plurality of guide pulleys rotatably mounted within said channel;

a document transport belt journaled about said pulleys to have its upper surface parallel to and lying slightly above the plane of the surface of said bed adjacent said central channel;

a shaft mounted for rotation about an axis above said bed and extending in the direction of said linear path;

an illumination mirror and an image mirror mounted on said shaft, both of said mirrors having a reflection plane lying upon the longitudinal axis of said shaft;

a light source mounted upon said structure and positioned to direct a beam of light onto the surface of said illumination mirror and reflect the beam to a point located upon said scanning arc on said bed;

a columnar photocell retina positioned to receive the image reflected by said image mirror of a character located at the illuminated point upon said scanning arc;

a roller housing supported above said bed and extending the length of said bed overlying said channel;

a plurality of rollers mounted within said housing; said rollers being biased into engagement with the surface of a document supported by said bed to press said document into frictional engagement with said belt;

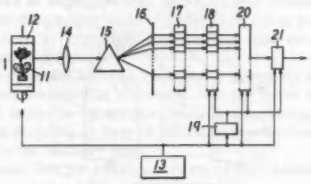
means for oscillating said shaft through a preselected arc to simultaneously illuminate the scan images of characters lying upon said scanning arc across said columnar retina; and

means for moving said belt to transport said document along the surface of said bed through said scanning arc while simultaneously oscillating said shaft to scan the lines of characters on said document.

3,942,154
METHOD AND APPARATUS FOR RECOGNIZING COLORED PATTERN

Hitoshi Akami, Yokohama; Shigeru Nishikawa, Kanagawa, and Tatsuya Kawakami, Tokyo, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed June 28, 1974, Ser. No. 484,178
Claims priority, application Japan, July 6, 1973, 48-76342
Int. Cl.² G06K 7/12
U.S. Cl. 340—146.3 B **8 Claims**



1. A colored pattern recognizing method for use in forming a colored pattern in a woven fabric, comprising the steps of storing values indicative of the level of light at a plurality of preselected wavelengths for each of a plurality of reference colors, scanning a pattern design to detect the spectrum of light from each picture element of the pattern, sampling said spectrum for each picture element at preselected wavelengths and generating electrical signals indicative of the level of light at each of said preselected wavelengths, retrieving stored values for a reference color, comparing the electrical signal for a given picture element at each preselected wavelength with the corresponding stored values for a reference color, generating a multibit binary output indicative of whether each electrical signal for the picture element is substantially identical to the corresponding stored value.

3,942,155
SYSTEM FOR PACKING PAGE FRAMES WITH SEGMENTS

Francis Daniel Lawlor, Hyde Park, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 3, 1973, Ser. No. 421,707
Int. Cl.² G06F 13/00
U.S. Cl. 340—172.5 **12 Claims**

1. Apparatus for partitioning page frame hardware components in a main store for packing a plurality of segments in any page frame, comprising

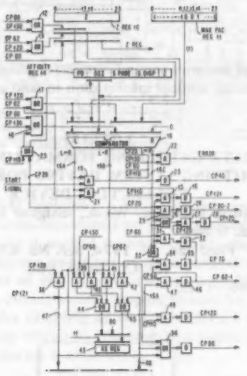
a first register for receiving and providing an affinity signal locating an existing segment with which a new segment is to be packed in a page frame,

means for accessing a flag field for an affinity page frame containing a first page of the existing segment located by said first register,

a second register receiving and providing a size signal for the new segment,

comparator means connected through gate circuits to said first register and to said second register and to partition size signals to provide a first electrical signal if the new segment size is greater than one partition in a page frame and to provide a second electrical signal if the new segment size is less than a maximum packable segment,

gating means and an AND circuit for testing a packing bit and an availability flag bit in said flag field for generating electrical signals indicating if the affinity page frame is packable and which partition in the page frame is available,



an offset register to provide signals for locating partitions of a page frame,

means for connecting said offset register to an output of said gating means to set the offset register to the location of a partition found available by said gating means, and

means for generating and storing electrical pointer signals for delineating and locating the new segment by actuating other gating circuits with said first and second electrical signals to transfer output signals from said second register and from said offset register to a pointer register,

whereby said pointer register contains signals for locating the new segment in the available partition in the page frame of the existing segment.

3,942,156
INDIRECT ARITHMETIC CONTROL

Howard C. Mock, Rancho Palos Verdes; Kenneth N. Isaac, Tustin; Charles P. Disparte, and Warren L. Hall, both of Palos Verdes Peninsula, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

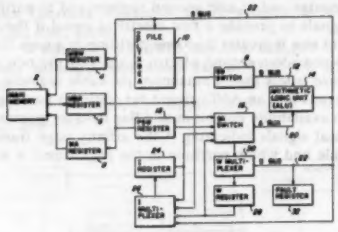
Filed Dec. 17, 1973, Ser. No. 425,352
Int. Cl.² G06F 13/00, 13/06
U.S. Cl. 340—172.5 **17 Claims**

1. In a microprogrammable computer of the type having data registers, an arithmetic logic unit, control lines for controlling the transfer of data between said data registers and said arithmetic logic unit, and a control memory comprising first circuit for storing microprograms and second circuit for executing said microprograms and for coupling the control information generated by said microprogram execution to said control lines, an improved indirect arithmetic control circuit comprising:

addressable memory means for storing indirect arithmetic control information,

addressing means for coupling the data from one of said data registers to said addressable memory means address inputs, and

gating means responsive to a microprogram indirect arithmetic control instruction currently being executed by said



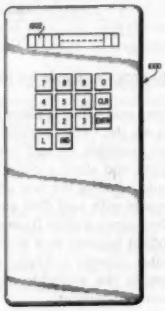
control memory second circuit for coupling said indirect arithmetic control information to said control lines.

3,942,157

DATA GATHERING FORMATTING AND TRANSMITTING SYSTEM HAVING PORTABLE DATA COLLECTING DEVICE

Leo L. Azure, Richland, Wash., assignor to Azurdata Inc., Richland, Wash.

Filed Jan. 22, 1974, Ser. No. 435,540
Int. Cl.² G06F *3/04*
U.S. Cl. 340—172.5 49 Claims



1. In an electronic data collection system for collecting and storing information items including items of source data for subsequent supply of the stored data items to separate utilization means in block organization of at least one line of header information common to and identifying the origin of the source data and at least one line containing at least one source data item for each such block of data, a portable source data collection device for use in said system comprising:

a keyboard having a control key selectively operable to enter a header symbol for each block of data and character keys for entering characters corresponding to information items of the header and source date lines;

means responsive to each said key actuation to produce a respectively corresponding coded electrical signal;

a solid state memory for receiving and storing the said coded electrical signals from said producing means responsive to key actuation and having a capacity of storing plural said lines of data for at least one said block thereof;

said memory storing said signals from said producing means for each block including, in a predetermined relationship, the header symbol, the characters of a header line and a line designation symbol for each successive header line, and the characters of a source data line and a line designation symbol for each successive data line,

means for selectively displaying the characters of at least a group of related characters of one of said lines as entered into said memory, and

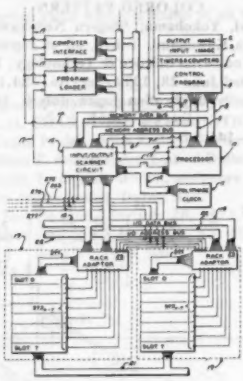
means for associating a portable electrical energy storing means with said portable data collection device to supply electrical energy therefrom to all of the aforesaid means, keyboard and memory comprising said data collection device.

3,942,158

PROGRAMMABLE LOGIC CONTROLLER

Ernst Dummermuth, Chesterland, Ohio, assignor to Allen-Bradley Company, Milwaukee, Wis.

Filed May 24, 1974, Ser. No. 473,149
Int. Cl.² G06F *7/00, 9/06*
U.S. Cl. 340—172.5 21 Claims



1. A programmable controller for operating a controlled system having a plurality of input and output devices the combination comprising:

a random access memory which stores a set of instructions that comprise a control program, which stores a first set of status bits that comprise an input image table and that correspond to input devices on the controlled system, and which stores a second set of status bits that comprise an output image table and that correspond with output devices on the controlled system;

a processor connected directly to said random access memory and including means for continuously cycling said random access memory to execute said control program and to thereby update the status of said output image table in response to the status of said input image table;

interface circuitry connected to the input and output devices on said control system for converting signals from said input devices which are indicative of their status to corresponding logic level signals and for converting logic level signals to signals for driving said output devides to an indicated status; and

a scanner circuit connected directly to said random access memory and to said interface circuitry, said scanner circuit including means connected to said processor for interrupting the operation of said processor to steal a memory cycle, date input means operable during an interrupt to couple the status of selected input devices from said interface circuit to the input image table, and data output means operable during an interrupt to couple the status of selected bits in said output image table to the interface circuit for driving corresponding selected output devices on said controlled system, wherein the status bits which comprise said input and output image tables are stored in separately addressable lines in said random access memory, each of which lines contains a plurality

of status bits, said scanner circuit includes an I/O address counter which addresses one line in said random access memory during each interrupt, and all the status bits in said addressed line are coupled with said interface circuit during the interrupt.

3,942,159

OPTICAL READOUT DEVICE

Masana Minami, Tokyo, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Dec. 20, 1973, Ser. No. 426,598

Claims priority, application Japan, Dec. 21, 1972, 47-127716

Int. Cl.[2] G11C 11/42

U.S. Cl. 340—173 LM 1 Claim

1. An optical readout device comprising:

a gas discharge display panel provided with a plurality of spot light sources selectively energized to emit light,

a memory plate having a plurality of items of information stored in alignment with said spot light sources,

address designating means to selectively cause the spot light sources to emit light to illuminate the corresponding items of information,

a fly's eyes lens having a plurality of extremely minute unit lenses arranged in alignment with the items of information stored in the memory plate and focussing a beam of light denoting an item of information selectively read out from the memory plate,

an image lens for imaging a beam of light passing through any fly's eyes lens,

a character pattern treating circuit for receiving light beams denoting the items of information read out from the image lens to suppress any harmful effect of scars or dust appearing on the memory plate comprising

a photodetector for receiving light beams denoting the items of information read out from the image lens,

a sampling pulse generator,

a sampling circuit,

delay means,

an AND gate,

a shift register,

an OR gate,

memory means,

a printer,

means connecting the output of the photodetector to a first input of the sampling circuit and to a first input of the sampling pulse generator,

means connecting the output of the sampling pulse generator to a second input of the sampling circuit,

means connecting the output of the sampling circuit to the input of the delay means, to a second input of the AND gate, to a second input of the shift register, and to a second input of the OR gate,

means connecting the output of the delay means to a first input of the AND gate,

means connecting the output of the AND gate to a first input of the shift register,

means connecting a first output of the shift register to a second input of the sampling pulse generator and means connecting a second output of the shift register to a first input of the OR gate,

means connecting the output of the OR gate to the input of the memory means,

means connecting the output of the memory means to the input of the printer.

3,942,160

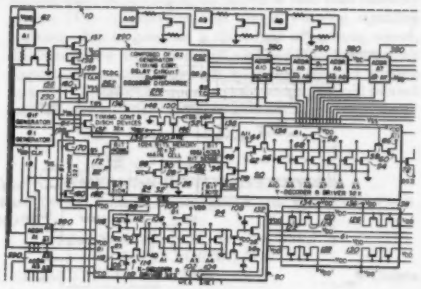
BIT SENSE LINE SPEED-UP CIRCUIT FOR MOS RAM

Robert Tapei Yu, Tempe, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Filed June 3, 1974, Ser. No. 475,560

Int. Cl.[2] G11C 13/00

U.S. Cl. 340—173 R 7 Claims



1. A MOS RAM including a bit sense line speed-up of circuit, said bit sense line speed-up circuit including a first inverter circuit and a second inverter circuit, each of said inverter circuits having an output coupled, respectively, to an input of the other of said inverter circuits, said MOS RAM comprising MOS circuit means coupled to said bit sense line speed-up circuit for disabling an output MOSFET of said bit sense line speed-up circuit in response to a signal applied to said MOS RAM during a write cycle.

3,942,161

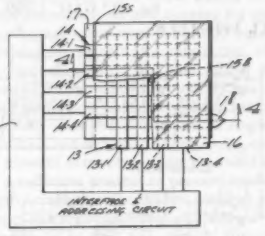
SELECTIVE CONTROL OF DISCHARGE POSITION IN GAS DISCHARGE DISPLAY/MEMORY DEVICE

Bernard W. Byrum, Jr., Toledo, and Roger E. Ernsthausen, Luckey, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 267,102, June 28, 1972, Pat. No. 3,823,394. This application June 25, 1974, Ser. No. 482,875

Int. Cl. H03b 37/00; H01j 17/04

U.S. Cl. 340—173 PL 1 Claim

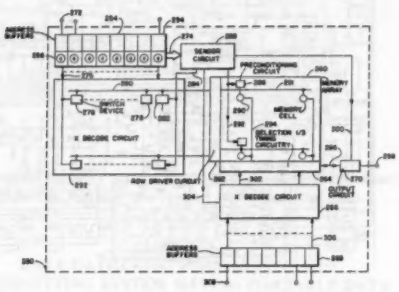


1. In a multiple gaseous discharge display/memory panel characterized by two opposing dielectric charge storage surfaces backed by electrode arrays defining gas discharge cell sites, the improvement wherein the gas discharge of a selected gas discharge cell is controllably positioned by providing opposing areas of high electron yield material selected from magnesium oxide, cesium oxide and cesium halides on each opposing dielectric charge storage surface, each area being located at or near a cell site and surrounded by a low electron yield material selected from carbon and silicon.

3,942,162
PRE-CONDITIONING CIRCUITS FOR MOS INTEGRATED CIRCUITS

John K. Buchanan, Tempe, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Filed July 1, 1974, Ser. No. 485,191
Int. Cl.[2] G11C 7/00
U.S. Cl. 340—173 R 12 Claims



1. A digital data processing circuit having therein a precharge node and having a plurality of inputs comprising:

circuit means coupled to said input responsive to a signal applied at said input;

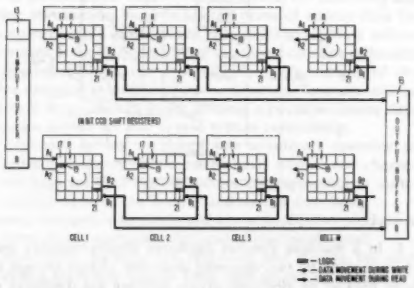
look-ahead precharge circuit means coupled between plurality of said inputs to said digital data circuit and said precharge node and also coupled to said circuit means for detecting a change in a logic level of any of said inputs and precharging said precharge node in response to said change in said logic level; and

wherein said digital data processing circuit is a read only memory including address buffer circuits, row and column decode circuits, and a digital storage array and wherein said precharge node is a sense bus in said data storage array.

3,942,163
CCD STACK MEMORY ORGANIZATION

Deepak K. Goyal, Princeton, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Filed June 21, 1974, Ser. No. 481,728
Int. Cl.[2] G11C 13/00
U.S. Cl. 340—173 R 10 Claims



1. A charge coupled device stack memory system providing last-in-first-out operation in response to read and write signals comprising:

an input buffer means for storing data to be inputted to said stack;

an output buffer means for storing data to be outputted from said stack;

a plurality of rows each including a plurality of loops of charge coupled shift register cells;

means for applying a two phase clock to circulate the data bits in said cells;

first logic means for gating data from said input buffer means to the first loop in each said row and from each loop in a said row to the next successive loop in that row in response to a first control signal, for gating data to the said output buffer means from each said first loop and from each loop in a said row to the next preceding loop in that row in response to a second control signal and for gating data around said loop in response to third and fourth control signals;

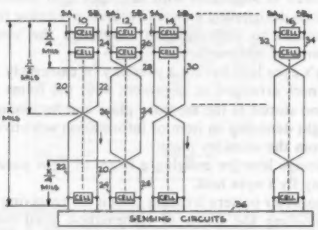
control means for maintaining an indication of the position of the data bits in said shift register cells; and

second logic means responsive to a said read signal, a said write signal and said indication of said control means to produce said first, second, third and fourth control signals.

3,942,164
SENSE LINE COUPLING REDUCTION SYSTEM

William C. Dunn, Scottsdale, Ariz., assignor to Semi, Inc., Phoenix, Ariz.

Filed Jan. 30, 1975, Ser. No. 545,737
Int. Cl.[2] G11C 11/40, 13/00
U.S. Cl. 340—173 R 4 Claims



1. In a semi-conductor memory wherein the storage elements of said memory are arranged in an array of rows and columns and there is provided a parallel pair of sense lines for each column of memory elements, to which all the elements of a column are connected, the improvement comprising,

transposing the locations of the sense lines in each pair of sense lines which are alternate pairs of sense lines in said array at a first predetermined distance from one end along the length of said alternate pairs of sense lines, and

interchanging the locations of each pair of sense lines in the remaining pairs of sense lines at a second predetermined distance from one end of each said pair of remaining pairs of sense lines.

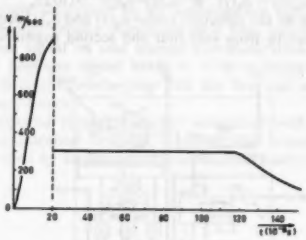
3,942,165
DEVICE OPERATING WITH THE DISPLACEMENT OF MAGNETIC DOMAIN WALL

Franciscus Hermanus deLeeuw, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed July 10, 1974, Ser. No. 487,018
Claims priority, application Netherlands, July 23, 1973, 7310196
Int. Cl.[2] G11C 11/14
U.S. Cl. 340—174 TF 4 Claims

1. A data processing device utilizing magnetizable media operating with the displacement of magnetic domain walls and comprising a layer of a magnetisable material having an easy axis of magnetisation substantially perpendicular to the plane of the layer, means to produce and maintain magnetic domain walls in said layer, and means to produce a magnetic propulsive field to influence magnetic domain walls present in the

layer so as to move them between previously determined positions, and means to pulse said propulsive field acting upon a domain wall during the movement having a pulse duration



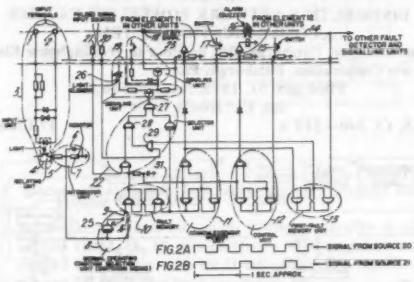
which is shorter than the time in which a function representing the relation between the speed at which the wall moves under the influence of the propulsive field and the time shows a discontinuity.

3,942,166

FAULT DETECTION AND SIGNALING SYSTEM

Juan Jose Zubeldia Peral, and Jose Luis Gomex Llona, both of Munguia, Spain, assignors to Arteche, Instrumentacion y Sistemas Electronicos, S.A., Munguia, Spain

Filed June 10, 1974, Ser. No. 477,687
Claims priority, application Spain, June 16, 1973, 415997
Int. Cl.[2] G08B 25/00; H04Q 9/00
U.S. Cl. 340—213.1 **16 Claims**



1. A multiple fault detection and signaling system for monitoring an electrical apparatus, comprising:

sensing means (3,4,5,8) coupled to said monitored electrical apparatus, said sensing means sensing a first fault in the monitored electrical apparatus and generating a detection signal corresponding to said sensing of said first fault;

signaling means (10,22,20,21,19,23) including a fault memory means (10) and a single warning signaling element (26), said signaling means including means responsive to said detection signal for energizing said single warning signaling element to generate a first type of warning signal which indicates said sensing of said first fault;

memory means (11) coupled to said signaling means, said memory means (11) being responsive to said generation of said detection signal for storing an indication of said sensing of said first fault;

means (17) coupled to said memory means (11) and including: means operable for indicating that said first fault is "acknowledged"; and means for causing said signaling means to energize said single warning signaling element (26) to (i) generate a second type of warning signal, distinguishable from said first type of warning signal, if said first fault still exists and (ii) to cease generation of said first type of warning signal if said first fault no longer exists; and

a fault memory means (13) operable to store a signal indicating a second fault sensed by another fault detection and signaling system, and operatively coupled to said signaling means;

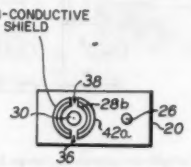
said signaling means including means responsive to said second fault indicating signal stored in said fault memory means (13) to energize said single warning signaling element (26) to generate a third type of warning signal, distinguishable from said first and second type warning signals, when said first fault is sensed by said sensing means (3,4,5,8) subsequent to said sensing of said second fault by said another fault detection and signaling system.

3,942,167

IMMERSION RESPONSIVE SENSOR

Richard D. McClintock, Washington Road, Woodbury, Conn. 06798

Filed Sept. 19, 1973, Ser. No. 398,776
Int. Cl.[2] G08B 21/00
U.S. Cl. 340—244 C **8 Claims**

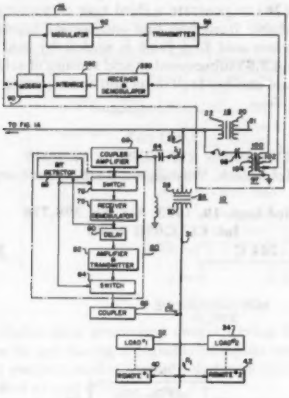


1. Apparatus responsive to immersion in water in an open environment to complete an electrical circuit through which a signalling means is energized from an electrical energy source, said immersion responsive apparatus comprising latchable means responsive to completion of said circuit for latching said signalling means in an energized condition, a housing for said signalling means, a first inner electrically conductive element protruding from said housing and a second outer element protruding from said housing and substantially peripherally surrounding said first inner element to form a circumferential electrical shield for said first inner element to prevent said latchable means from latching in response to interference transients, said electrical shield having an opening at an end thereof opposite from said housing for enabling water to enter therethrough upon immersion, said outer electrical shield comprising an electrically conductive element which comprises a ground element for said circuit and an outermost non-conductive element surrounding said outer shield conductive element, said water completing said circuit between said electrically conductive elements in response to said immersion, said first and second elements being coextensive with said first element extent being less than said second element extent by a sufficient amount to prevent inadvertent electrically conductive contact with said first element prior to said immersion, said outer circumferential electrical shield having an air passageway in said peripherally surrounding portion for enabling the venting of air from within the interior of said outer electrical shield element at substantially any depth of immersion of said first and second elements in water less than total immersion while preventing the inadvertent entry of splash water prior to said immersion, said air passageway extending substantially the full longitudinal extent of said outer electrical shield and extending through said elements comprising said outer shield element, whereby water may enter within said outer electrical shield element interior to contact said first element and complete said electrical circuit at immersion depths where the water pressure is normally insufficient to cause said entry without venting of air and false signalling due to interference transients is prevented.

3,942,168
DISTRIBUTION NETWORK POWER LINE COMMUNICATION SYSTEM

Ian A. Whyte, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 31, 1975, Ser. No. 546,070
Int. Cl.² H04M 11/04
U.S. Cl. 340—310 R **7 Claims**



1. A distribution network power line carrier communication system including electrical power lines extending from a distribution substation to a plurality of electrical loads, comprising:
first terminal means at the distribution substation in signal communication with the electrical power lines,
said first terminal means applying an interrogation signal to the electrical power lines,
and repeater means remote from the distribution substation in signal communication with the electrical power lines,
said repeater means repeating said interrogation signal,
said repeater means including means for receiving the interrogation signal from the electrical power lines, delay means for delaying the interrogation signal for a predetermined time interval, means applying the delayed interrogation signal to the electrical power lines, and means preventing the repeater means from repeating said delayed interrogation signal.

3,942,169
PATTERN RECOGNITION SYSTEM

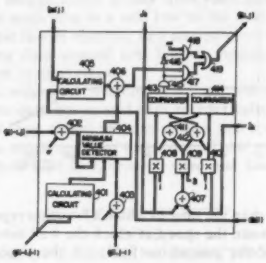
Yoshiji Fujimoto, Hachioji; Shozo Kadota, Kokubunji; Michio Yasuda, Koganei; Shinichi Hayashi, Kokubunji, and Toshihiro Hananoi, Odawara, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Sept. 6, 1974, Ser. No. 503,956
Claims priority, application Japan, Sept. 10, 1973, 48-101202
Int. Cl.² G06K 9/12
U.S. Cl. 340—146.3 AE **2 Claims**

1. In a character recognition system in which line components making up an unknown character pattern and a standard character pattern are approximated by means of a plurality of directional small straight lines in the number of n, each of the patterns being described in the form of a plurality of codes representing the directions of said small straight lines along said component lines, said two code groups $A_k = a_k(0), a_k(1), a_k(2) \ldots a_k(I_k)$, and $B_k = b_k(0), b_k(1), b_k(2) \ldots b_k(J_k)$ being used to effect a character recognition; the improvement comprising first and second registers for respectively storing said direction codes A_k and B_k, a direction difference calculator circuit for calculating the difference between the direction codes, that is,

$d(a_k(i), b_k(j))$
$= a_k(i) - b_k(j)$ if $a_k(i) - b_k(j)$ (n/2)
$= n - a_k(i) - b_k(j)$ if $a_k(i) - b_k(j) > (n/2)$,

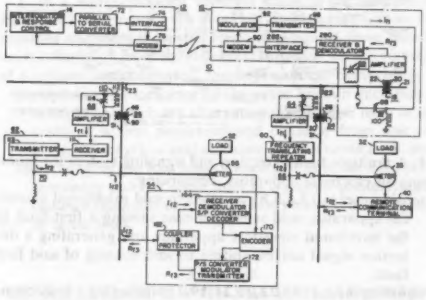
in response to the direction codes $a_k(i)$ and $b_k(j)$ sequentially applied thereto from said first and second registers, a minimum value detector circuit for obtaining the minimum value of $g(i, j-1) + \sigma$, $g(i-1, j) + \sigma$, and $[g(-1)]$, σ being constant, when $d(a_k(0), b_k(0))$ is defined as $g(0, 0)$, an adder for obtaining a sum $g(i, j)$ of the output $d(a_k(i), b_k(j))$ of said direction difference calculator circuit and the output min $g(i, j-1) + \sigma$, $g(i-1, j) + \sigma$, $[g(i-1, j-1)]$ of said minimum value detector circuit, and a circuit means for taking out the output $g(I_k, J_k)$ from the output $g(i, j)$ of said adder.



3,942,170
DISTRIBUTION NETWORK POWERLINE CARRIER COMMUNICATION SYSTEM

Ian A. Whyte, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 31, 1975, Ser. No. 546,068
Int. Cl.² H04M 11/04
U.S. Cl. 340—310 A **17 Claims**



1. A powerline communication system, comprising:
frequency translating repeater means,
uniquely addressable remote communication terminals,
means providing an interrogation signal in a first frequency band which includes an address of a selected remote communication terminal,
a first communication link including powerline conductors and magnetic field coupler means interconnecting said means which provides said interrogation signal and said repeater means,
a second communication link including powerline conductors interconnecting each repeater means with certain of said remote communication terminals,
each of said repeater means including means for changing the frequency of said interrogation signal to a second

frequency band which is non-overlapping with said first frequency band, and means for applying the resulting interrogation signal to its associated second communication link,

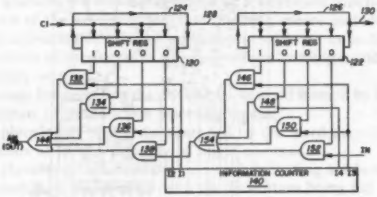
each of said remote communication terminals, when uniquely addressed by an interrogation signal over its associated second communication link, providing a response signal on said second communication link, with said response signal being in a third frequency band which is non-overlapping with the first and second frequency bands,

and response receiving means associated with said first communication link for receiving the response signal provided by an addressed remote communication terminal.

3,942,171
SCANNING SYSTEM FOR DIGITAL-ANALOG CONVERTER

Tegze P. Haraszti, and Wiley Preston Snuggs, both of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 3, 1974, Ser. No. 457,664
Int. Cl.² H03K *13/02*
U.S. Cl. 340—347 DA **4 Claims**



1. A scanning system for a digital to analog converter comprising:

a. information register means for storing a plurality of digital bits I1, I2, I3...IN representative of a magnitude of a desired DC voltage with bit I1 being the most significant bit and IN being the least significant bit;

b. a plurality of four stage circulating shift registers each associated with a different odd numbered one of the bits stored in said information register and with the next lower bit, said shift register associated with said most significant bit being clocked at a clock frequency of f_c and each other shift register being clocked at a frequency of one-fourth the clocking frequency of the shift register associated with the next more significant bit;

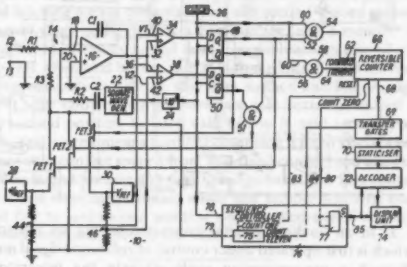
c. four gates associated with each shift register each being responsive to a different output of said shift register and to a second input, the second input of the first and third of said four gates being connected with the output of said information register representing said odd numbered bit associated with said shift register, the second input of the second of said four gates being connected to the output of said information register representing said next lower bit associated with said shift register, the second input of the fourth of said four gates being connected to the output from the shift register-gate combination associated with the next lower significant bits of said information register; and

d. a fifth gate responsive to the outputs of said four gates to produce an output from the shift register gate combination with which it is associated.

3,942,172
BIPOLAR MARK-SPACE ANALOGUE-TO-DIGITAL CONVERTER

Roger Lewis Raymond Tucker, Farnborough, England, assignor to The Solartron Electronic Group Limited, Farnborough, England

Filed June 13, 1974, Ser. No. 479,015
Claims priority, application United Kingdom, June 29, 1973, 31027/73
Int. Cl.² H03K *13/02, 13/20*
U.S. Cl. 340—347 NT **15 Claims**



1. A bipolar mark-space analogue-to-digital converter comprising:

integrating means for receiving an analogue input signal to be converted;

means for including a periodic signal component in the output signal produced by the integrating means in addition to the output signal component of the integrating means due to the analog input signal;

first and second level detectors connected to compare the output signal from the integrating means with first and second detector levels respectively, whereby analogue input signals of one polarity cause the magnitude of the output signal from the integrating means to exceed the first level by crossing it in a direction away from the second level, while analogue input signals of the other polarity cause the magnitude of the output signal from the integrating means to fall below the second level by crossing it in a direction away from the first level, the first and second level detectors being arranged to produce first and second control signals respectively when the magnitude of the output signal from the integrating means exceeds the first level and falls below the second level respectively;

first and second reference signal sources of opposite polarity;

switch means responsive to the first control signal to apply one of said reference signal sources, opposite in polarity to said one polarity of the analogue input signal, to the integrating means, said switch means being also responsive to the second control signal to apply the other of said reference signal sources to the integrating means;

means for defining a conversion interval equal in duration to the duration of an integral number of cycles of said periodic signal;

a source of clock pulses; and

counter means for counting the clock pulses during the application of either of the reference signal sources to the integrating means, whereby the count in the counter means at the end of the conversion interval is a digital representation of the magnitude of the integral of the analogue signal over the conversion interval.

3,942,173

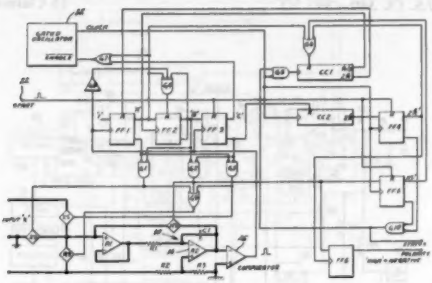
OFFSET ERROR COMPENSATION FOR INTEGRATING ANALOG-TO-DIGITAL CONVERTER

Ivar Wold, Medfield, Mass., assignor to Analog Devices, Inc., Norwood, Mass.

Continuation-in-part of Ser. No. 380,690, July 19, 1973, Pat. No. 3,872,466. This application July 15, 1974, Ser. No. 488,415

Int. Cl.² H03K *13/20*

U.S. Cl. 340—347 NT **8 Claims**



1. In an analog-to-digital converter having an integrator which is first operated under control of reference signal means through a pre-conversion cycle wherein the integrator is ramped away from a datum level for a predetermined clock-pulse time and then is ramped back to the datum level, whereby the difference between the clock-pulse time of return to said datum level and a first predetermined clock-pulse time after the start of said pre-conversion cycle defines a digital offset error signal; the integrator thereafter being operated, under control of an unknown input signal and reference signal means, through a conversion cycle wherein the integrator is ramped away from datum level for a first time period and then is ramped back to datum level to develop a digital output signal corresponding to the clockpulse time difference between the second return to said datum level and the end of a second time period following said first time period, said digital output signal indicating the magnitude of the unknown signal applied to the integrator during at least part of said conversion cycle;

that improvement in said converter comprising:

first time-control means arranged to terminate said first time period at a time which is a second predetermined number of clock pulses after said first predetermined clock pulse time, whereby the length of said first time period is a simple add/subtract function of said offset error time difference; and

second time-control means arranged to terminate said second time period at a time which is a third predetermined number of clock pulses after the start of said first time period.

3,942,174

BIPOLAR MULTIPLE RAMP DIGITISERS

Howard Anthony Dorey, Godalming, and Geoffrey Arthur Luckhurst, Farnborough, both of England, assignors to The Solartron Electronic Group Limited, Farnborough, England

Filed Dec. 21, 1973, Ser. No. 427,187

Claims priority, application United Kingdom, Dec. 22, 1972, 59362/72

Int. Cl.² H03K *13/02*

U.S. Cl. 340—347 NT **6 Claims**

1. An integrating analogue-to-digital converter for producing a digital output signal representative of the magnitude of an analogue input signal, the converter comprising:

an input terminal for receiving the analogue input signal;

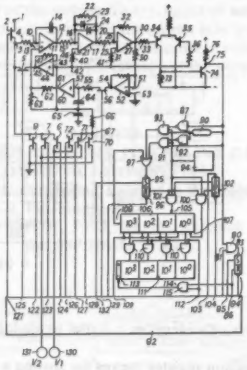
integrating means comprising a differential amplifier having an inverting input, a non-inverting input and an output, and an integrating capacitance negative-feedback connected between said output and said inverting input;

first switch means for coupling the input terminal to a predetermined input of the differential amplifier during a first time interval, whereby the capacitance is charged to a voltage whose magnitude and polarity are dependent upon the magnitude and polarity of the analogue input signal;

polarity testing means arranged to receive a signal representative of the voltage across said capacitance and responsive thereto to produce an output signal having a first level representative of one polarity of the voltage across the capacitance and a second level representative of the other polarity of the voltage across the capacitance;

a source of at least one reference voltage;

second switch means responsive to the output signal produced by the polarity testing means at the end of the first time interval to couple the reference voltage source to said predetermined input of the differential amplifier if



the analogue input signal and the reference voltage are of different polarity, whereby to discharge the capacitance, and to couple the reference voltage source to the other input of the differential amplifier and temporarily to said predetermined input if the analogue input signal and the reference voltage are of the same polarity, whereby to slew the respective voltages at both inputs and the output of the differential amplifier by an amount equal to the reference voltage, while preserving the voltage across the capacitance substantially unchanged, and to subsequently discharge the capacitance, the discharging of the capacitance taking place, in either case, during a second time interval whose end is indicated by a change in the output signal produced by the polarity testing means from one level to the other;

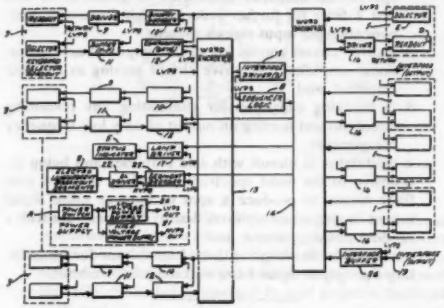
a source of clock pulses; and

pulse counter means arranged to count clock pulses during the second time interval, whereby to produce a digital output signal representative of the magnitude of the analogue input signal.

3,942,175
MULTIPURPOSE KEYBOARD SYSTEM

Don E. Collins, Kernersville, N.C., and John F. Turner, Fullerton, Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 27, 1975, Ser. No. 563,004
Int. Cl.[2] G08C 9/00
U.S. Cl. 340—365 R **3 Claims**



1. A system for varying the function of a keyboard comprising:

a. a plurality of means for selecting a keyboard function, each of the keyboard function selecting means including an activating switch and an indicator with the collective outputs of the function selecting means forming a coded binary word;

b. means for decoding the coded binary word formed by the outputs of the function selecting means;

c. a plurality of binary decoders fed by the word decoding means to form a plurality of single commands;

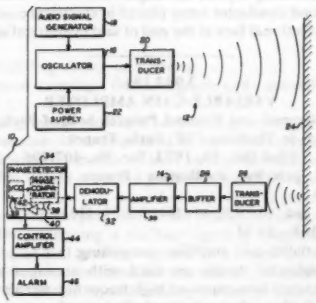
d. a plurality of information keys each including a selector switch and an indicator with the indicators being fed by one each of the plurality of binary decoders; and

e. a word encoder fed by the selector switches of the plurality of information keys for converting the outputs thereof into a single binary word representing the output of the keyboard system.

3,942,176
ULTRASONIC ALARM SYSTEM

Thomas F. Bright, Paterson, N.J., assignor to Bergen Laboratories, Inc., Paterson, N.J.

Filed Feb. 4, 1974, Ser. No. 439,409
Int. Cl.[2] G08B 1/08; H04B 11/00
U.S. Cl. 340—416 **10 Claims**

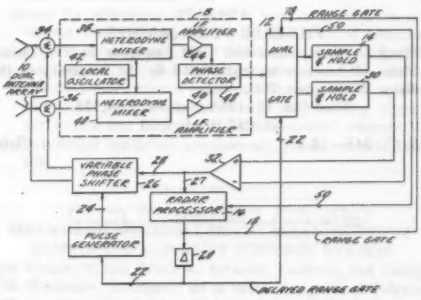


1. An ultrasonic alarm system comprising a transmitter, said transmitter comprising an ultrasonic carrier frequency signal generator, modulation means for modulating said carrier signal with a modulation signal, and transmission means for transmitting said modulated ultrasonic carrier signal; and at least one receiver, said receiver comprising receiving means for receiving said transmitted modulated ultrasonic carrier signal, demodulating means for demodulating said modulated carrier signal to obtain said modulation signal, and detector means connected to said demodulating means and responsive to a predetermined characteristic of the demodulated signal for producing an alarm actuation signal, said switch means comprising a pushbutton having an enlarged diameter portion and a reduced diameter depending shaft, a button support having a through bore slidingly receiving said shaft for movement of said button from a first position to a second position, said latching means comprises first and second spaced grooves on said shaft connected by a cam surface, and a member on said board normally biased into engagement with one of said grooves when said button is in said first position, said member being operable to ride on said cam surface and into engagement with said second groove when said button is moved to the second position to latch said button in said second position, said switch means further comprising a fixed contact and a movable contact spaced from said fixed contact and abutting said enlarged portion and positioned to be moved into contact with said stationary contact when said button is moved from said first to said second position whereby said switch means is moved from the open to the closed position.

3,942,177
INTERFEROMETER RADAR ELEVATION ANGLE MEASUREMENT APPARATUS

Paul M. Danzer, Norwalk, and Giles E. Rae, Ridgefield, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed July 28, 1971, Ser. No. 166,754
Int. Cl. G01s 9/22
U.S. Cl. 343—16 M **4 Claims**



1. Apparatus for providing a signal proportional to the elevation angle of a target in response to target signals from a dual antenna array of a range gated radar apparatus, said radar apparatus including processing means for generating first signals representative of a signal parameter difference between the target return signal at each antenna of said array, said parameter difference relating to the elevation angle of the target with respect to the array, and including means for providing a time shifted pair of pulses for each range gate, comprising:

means responsive to one of said pair of pulses for generating pseudo target signals having a controlled simulated variable parameter difference, as an alternative input to said processing means, said processing means additionally providing a second signal representative of said parameter difference of said pseudo signals;

gating means, concurrently responsive to said time shifted pair of pulses and signals provided by said processing means, for coincidently providing third and fourth sig-

nals, each proportional to related ones of said first and second signals, respectively; and

means comparing said third and fourth signals for providing a fifth signal, representative of said parameter difference of said pseudo signals, causing said parameter difference to vary, in response to said fifth signal, in a manner tending to cause said third and fourth signals to be substantially equal.

3,942,178

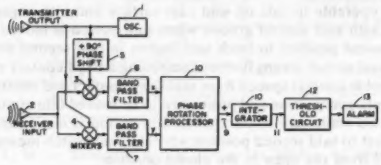
INTRUSION DETECTION SYSTEM

Kenneth R. Hackett, Boulder, Colo., assignor to Sontrix, Inc., Boulder, Colo.

Filed Mar. 27, 1974, Ser. No. 455,260

Int. Cl.² G01S 9/02; G08B 13/18

U.S. Cl. 343—5 PD **10 Claims**



1. The method of detecting moving target echos in the presence of interference comprising the steps of radiating energy and receiving echo return energy, hetrodyning radiated and received energy signals to produce separate quadrature beat frequency signals, differentiating and amplitude limiting one of said beat frequency signals, multiplying the differentiated and limited signal and the other beat frequency signal to obtain the four quadrant product of the signals multiplied, and integrating said product.

3,942,179

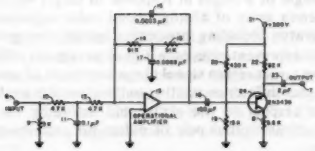
FILTERED-NOISE JAMMER

Clifford G. Dorn, Riverside, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 18, 1968, Ser. No. 768,935

Int. Cl.² H04K 3/00

U.S. Cl. 343—18 E **1 Claim**



1. An improved noise jamming device for producing a non-uniform RF spectrum with a random density pattern comprising:

a. a noise source generating a continuous spectrum of noise frequencies from direct current to about 5 MHz,

b. a low pass filter means in circuit with said noise source attenuating all frequencies above a selected cut-off frequency within the range of from 500 Hz to 5 KHz,

c. an amplifier in circuit with said low pass filter means for amplifying the output of said low pass filter means,

d. said low pass filter means and said amplifier in circuit therewith forming a single integrated circuit comprising:

1. a first T-filter network for filtering high frequencies which allow direct current and lower frequencies to pass,

2. an operational amplifier having a feedback network and a second T-filter both in parallel therewith, said operational amplifier connected to amplifier of said first T-filter for further reducing high frequency components from input signals thereto,

3. a drive circuit connected to the output of said operational amplifier, said drive circuit serving as a power amplifier, and

4. a blocking capacitor for eliminating any remaining direct current leaving an output of only low frequency components,

e. a modulator in circuit with said amplifier and being responsive to the noise spectrum passed by said low pass filter means to produce a spot or barrage noise signal output having a non-uniform density RF spectrum with a random density pattern, and

f. a transmitter in circuit with said modulator for transmitting the output signal from said modulator circuit.

3,942,180

WIDE-BAND OMNIDIRECTIONAL ANTENNA

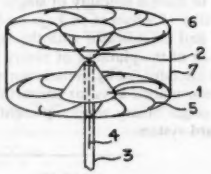
Jean Rannou, and William Luther, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Aug. 27, 1974, Ser. No. 500,940

Claims priority, application France, Aug. 31, 1973, 73.31520

Int. Cl.² H01Q 21/24

U.S. Cl. 343—725 **8 Claims**



1. A wide-band omnidirectional antenna comprising two co-axial truncated conductive cones for forming a bi-conical antenna, at least one array of conductors which are situated in a plane perpendicular to the said axis and which each has one of its ends in electrical contact with the major base of the cone with which it is associated, a cylindrical conductive section extending beyond the major base of one of said cones and a second conductor array placed in electrical contact with the cross-sectional face at the end of said cylindrical section.

3,942,181

VARIABLE-GAIN AMPLIFIER

François Berrod, and Fernand Puverel, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Oct. 19, 1973, Ser. No. 407,996

Claims priority, application France, Oct. 20, 1972, 72.37263

Int. Cl.² 330 29; G01S 9/22; H03F 1/34

U.S. Cl. 343—16 M **10 Claims**

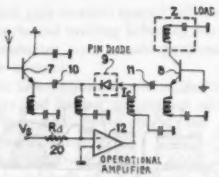
1. A variable-gain amplifier comprising:

semiconductor means provided with an input electrode connected to a source of high-frequency signals and with two further electrodes including a reference electrode whose potential relative to that of said input electrode determines the conductivity of said semiconductor

means, one of said further electrodes being connected to a load;

degenerative circuitry connected to said reference electrode for applying thereto a negative-feedback voltage;

a PIN diode in said degenerative circuitry;



biasing means for said PIN diode including an operational amplifier provided with an inverting input, a non-inverting input, an output, and a negative-feedback path connected between said output and inverting input thereof, said PIN diode being inserted in said negative-feedback path; and

a source of gain-controlling voltage connected to one of the inputs of said operational amplifier.

3,942,182

RECORDING DEVICE

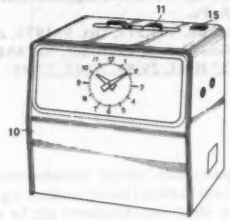
Reiji Sato, Yokohama, Japan, assignor to Amano Corporation, Yokohama, Japan

Filed Dec. 24, 1974, Ser. No. 536,215

Claims priority, application Japan, Dec. 26, 1973, 49-517[U]

Int. Cl.² G01D 9/36, 15/02

U.S. Cl. 346—53 **5 Claims**



1. A recording device comprising:

a. a support carrying a first receptacle and a second receptacle;

b. printing means mounted on said support and responsive to insertion of a time card in said first receptacle for printing an indication of time on the inserted time card;

c. reading means mounted on said support and responsive to insertion into said second receptacle of a plate member formed with a perforation for reading said perforation and for generating a reading signal in response to the reading of said perforation; and

d. recording means mounted on said support and operatively connected to said reading means for recording said reading signal on said inserted time card while said plate member is inserted in said receptacle.

3,942,183

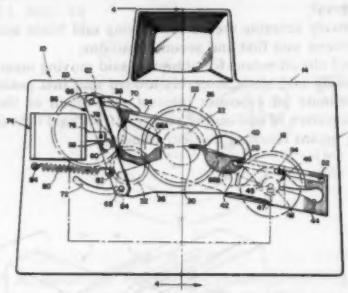
CAMERA WITH PIVOTING BLADES

George D. Whiteside, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed July 2, 1974, Ser. No. 485,128

Int. Cl.² G03B 9/14

U.S. Cl. 354—29 **13 Claims**



1. A pivoting exposure control system for photographic apparatus comprising:

means defining a light entering exposure opening having an optical axis therethrough;

at least one blade element having an aperture therethrough disposed about a curvilinear centerline for respectively blocking and unblocking the passage of light through said light entering exposure opening;

means for mounting said blade element in a manner whereby both linear and angular displacement of said blade element with respect to a first reference point spaced laterally apart from said light entering opening can be accommodate; and

means for selectively rotating at least one point on said shutter blade element about a second fixed reference point spaced laterally apart from said light entering exposure opening and first reference point so as to cause said shutter blade element to pivot with respect to said first reference point while simultaneously moving linearly across said first reference point in a manner whereby the curvilinear centerline continuously intersects said optical axis.

3,942,184

MEANS AND METHOD FOR CALIBRATING LIGHT RESPONSIVE EXPOSURE CONTROL SYSTEM

Igor Blinow, Millis; Bruce K. Johnson, Andover, and George D. Whiteside, Lexington, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 31, 1975, Ser. No. 563,694

Int. Cl.² G03B 7/08

U.S. Cl. 354—42 **14 Claims**

4. Exposure control apparatus together with support means for admitting a select amount of light corresponding to a select film speed during a photographic exposure interval wherein the exposure control apparatus may be utilized with a camera of the type having a housing and an objective lens mounted on the housing and defining a film plane, said exposure control apparatus and support means comprising:

a wall member;

means for detecting scene light incident thereon and for providing an output response;

a wall member;

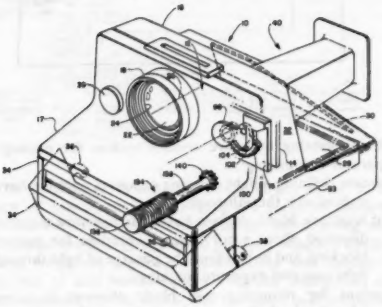
means for detecting scene light incident thereon and for providing an output response;

a blade assembly movable along a predetermined path between a first position wherein it precludes scene light

from reaching the film plane and light detecting means and a second position wherein it defines at least one maximum sized aperture which permits a maximum amount of scene light to impinge upon the film plane and light detecting means, said blade assembly serving to define at least one range of progressively increasing sized apertures as it moves from said first position toward said second position upon the commencement of an exposure interval;

selectively actuable means for moving said blade assembly between said first and second positions;

control circuit means for actuating said moving means into moving said blade assembly toward said first position to terminate an exposure interval as a result of the time integration of said output response from said light detecting means reaching a select value;



a light attenuating filter;

means for movably connecting said light attenuating filter with respect to said wall member thereby facilitating the positioning of said light attenuating filter in intercepting relation with a select portion of the scene light directed toward said light detecting means, said select intercepted portion of the scene light being determined during the manufacture of said exposure control system to provide the requisite output response from the light detecting means for the control circuit to actuate said scene light varying means to terminate an exposure interval in time to insure that the amount of scene light incident to the film plane substantially corresponds to the select film speed; and

means for permanently fixing the position of said light attenuating filter in immovable relation with respect to said wall member subsequent to the determination of said select intercepted portion of the scene light.

3,942,185

POLYCHROMATIC ELECTROLUMINESCENT DEVICE

Jacques Lebailly, Caen(Calvados), France, assignor to U.S. Philips Corporation, New York, N.Y.

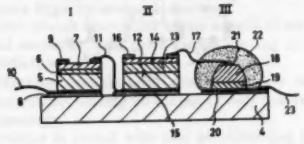
Division of Ser. No. 423,701, Dec. 11, 1973, Pat. No. 3,875,473. This application Nov. 8, 1974, Ser. No. 522,118

Claims priority, application France, Dec. 13, 1972, 72.44359

Int. Cl.² H01L *33/00*

U.S. Cl. 357—17 **5 Claims**

1. A method of energizing a polychromatic electroluminescent device including series connected at least a diode of gallium phosphide doped with zinc and oxygen and having an emissive surface of about 0.1 mm², a diode of gallium arsenide phosphide $GaAs_{1-x}P_x$,X being between 0.80 and 0.85, which is doped with nitrogen and having an emissive surface about 1 mm², and a diode of silicon-doped gallium arsenide which is covered with an epoxy resin in which grains of soidum yttrium fluoride which is doped with ytterbium and erbium are embed-



ded, and whose emissive surface is about 0.5 mm², characterized in that a current of 20 mA is continuously injected for displaying red, a current of 100 mA is injected by pulses of 0.3 msec. with a frequency of 1000 Hz for displaying yellow and a current of 700 mA is injected by pulses of 0.1 msec at a frequency of 1000 Hz for displaying green.

3,942,186

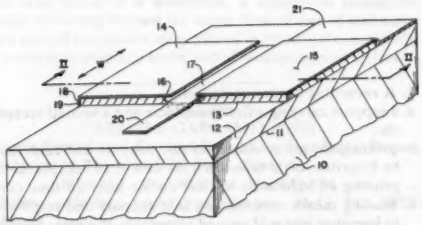
HIGH FREQUENCY, FIELD-EFFECT TRANSISTOR

Bruce R. McAvoy, Pittsburgh, and Michael C. Driver, Trafford, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 404,577, Oct. 9, 1973, abandoned. This application Mar. 3, 1975, Ser. No. 554,785

Int. Cl.² H01L *29/80, 29/48, 23/48*

U.S. Cl. 357—22 **10 Claims**



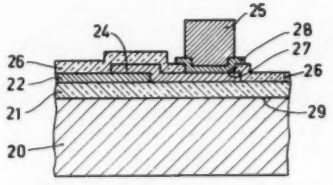
1. A high frequency, Schottky barrier gate field-effect transistor comprised of:

A. an epitaxial semiconductor layer having an N-type impurity concentration of between about 5×10^{16} and 5×10^{17} carriers/cm^3 and a thickness less than about 2 microns at least at portions adapted to support a gate contact;
B. elongated source and drain contacts spaced apart adjoining said semiconductor layer and making ohmic contact therewith;
C. an elongated gate contact spaced between the source and drain contacts and making Schottky barrier contact with the semiconductor layer at said portions adapted to support a gate contact;
D. a dielectric layer adjoining and supporting said semiconductor layer and having parameters adapted to provide effective dielectric constants at the gate and drain contacts greater than $\sqrt{2}$;
E. a conductor substrate having a major surface layer adjoining and supporting said dielectric layer; and
F. means for maintaining the conductor substrate and the source contact at substantially the same RF potential.

3,942,187
SEMICONDUCTOR DEVICE WITH MULTI-LAYERED METAL INTERCONNECTIONS

Richardus Johannes Henricus Gelsing, and Kees van Steensel, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 29, 1969, Ser. No. 888,504
Claims priority, application Netherlands, Jan. 2, 1969, 6900054
Int. Cl.² H01L *29/52, 29/54*
U.S. Cl. 357—71 **2 Claims**

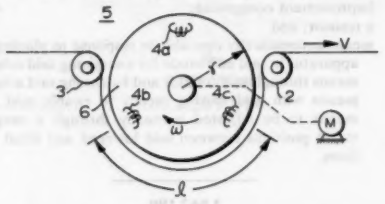


1. A semiconductor device comprising a semiconductor body having a surface, plural layers of insulating material over the surface of the semiconductor body and including a first insulating layer on said semiconductor surface, a first metal layer on said first insulating layer over at least part of its length and connected to a region of said semiconductor body at the surface, a second metal layer over said first insulating layer and laterally extending with respect to said first metal layer, and a third metal layer over said first insulating layer and connected to both said first and second metal layers, the second metal layer extending substantially entirely on the free surface of the uppermost insulating layer and being connected via at least one aperture in the uppermost insulating layer to the third metal layer, the third metal layer being situated substantially entirely between two of said insulating layers, the metal of the third metal layer being different from the metal of the first and second metal layers and forming with the latter where connected stable low-ohmic junction areas, the third metal layer being located relative to the first and second metal layers such that the projections onto the body surface of the junction areas where the third metal layer connects to the first and second metal layers are laterally spaced from one another whereby said junction areas are in non-overlying relationship.

3,942,188
MAGNETIC TAPE REPRODUCING SYSTEM

Kenzo Tanabe, and Mineo Mino, both of Katano, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Continuation of Ser. No. 367,185, June 5, 1973, abandoned. This application Oct. 31, 1974, Ser. No. 519,786
Int. Cl.² H04N *5/795*
U.S. Cl. 360—10 **2 Claims**

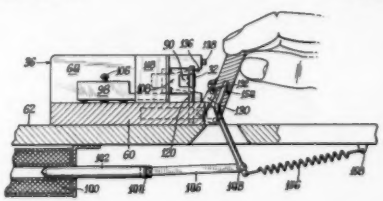


1. A magnetic tape reproducing system comprising a magnetic tape on which video signals are recorded in successive fields of a unit length in the longitudinal direction of said magnetic tape, each field of said video signals containing horizontal synchronizing signals, a rotating disc, a driving means coupled to said disc for rotating said rotating disc, a plurality of reproducing magnetic heads on the periphery of said rotating disc at equal angular intervals from each other, each of said plurality of reproducing heads being for reproducing a quasi-complete one field of said video signals, and means for moving said tape around said disc past said heads, all the distances on the periphery of said disc between the gaps of two adjacent heads at the relative speed of the tape and the disc being equal to each other and equal to an integral multiple of the distance $(\omega_R r_R + V_R)T_H$ along said tape corresponding to the length on the tape of said horizontal synchronizing signals, said integral multiple being around 262, ω_R being the speed of rotation of the recording heads for recording the signals, r_R being the radial distance of each recording head from the center of rotation thereof during recording, V_R being the speed of the magnetic tape during recording, and T_H being the period of said horizontal synchronizing signals.

3,942,189
MAGNETIC TAPE REPRODUCING APPARATUS WITH SOLENOID ACTUATED TAPE LIFTER MEANS AND AUTOMATIC CONTROL THEREFOR

John P. Jenkins, Towanda, Ill., assignor to International Tapetronics Corporation, Bloomington, Ill.

Filed July 18, 1974, Ser. No. 489,614
Int. Cl.² G11B *27/02*
U.S. Cl. 360—13 **11 Claims**



1. In reproducing apparatus, means selective to place said apparatus in play and fast modes in which tape is driven at play and fast speeds respectively past transducer head means;
tape lifter means movable to and from a lifted position disengaging the tape from the head means;
tape lifter moving means including biasing means and electrically energizable solenoid means connected to move said tape lifter means in opposite directions;

means automatically operable in response to placing said apparatus in play mode for changing the electrical energization state of said solenoid means to move said tape lifter means to a lowered position;

means automatically operable in response to placing said apparatus in fast mode for further changing the electrical energization state of said solenoid means to move said tape lifter means to said lifted position; and

means selective to place said apparatus in edit mode; the improvement comprising:

a resistor; and

means automatically operable in response to placing said apparatus in said edit mode for energizing said solenoid means through said resistor and balancing said solenoid means with said biasing means to enable said lifter means to be adjusted manually through a range of stable positions between said lowered and lifted positions.

3,942,190

METHOD AND APPARATUS FOR UNINTERRUPTED RECORDING AND REPRODUCTION IN A MULTICHANNEL MODE OF INFORMATION ON TAPE

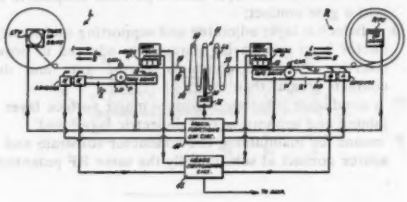
Barry C. Detwiler, New Milford, N.J., assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Mar. 21, 1974, Ser. No. 453,511

Int. Cl.[2] G11B *15/06*

U.S. Cl. 360—63 **18 Claims**

1. A multichannel tape information recording and playback system comprising a tape accumulator positioned along a path of tape travel through the system, a pair of tape drives positioned in spaced-apart relationship on opposite sides of said tape accumulator and adapted to pull said tape in reverse directions along the path of tape travel, a pair of tape head systems positioned on opposite sides of said tape accumulator and adapted to provide a flow of information relative to said tape, and a pair of tape storage reels for storing tape at the



opposite ends of the path of tape travel, said tape accumulator being adapted to store tape in motion while said tape is moving in a forward or reverse direction and for supplying tape in both the forward direction and reverse direction simultaneously while said tape is depleted from said accumulator so that the direction of motion of said tape is reversed without interrupting the flow of information relative to the tape.

DESIGN PATENTS

GRANTED MARCH 2, 1976

ERRATA

For CLASS	See PATENT NO.
061–001 T	239,014

DESIGNS

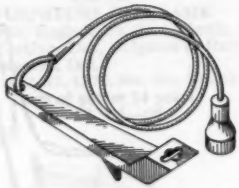
MARCH 2, 1976

238,982
CORSELETTE
Jack J. Lo Cascio, Bayonne, and Harold Stern, Wyckoff, N.J., assignors to International Playtex, Inc., New York, N.Y.
Filed Oct. 3, 1974, Ser. No. 511,866
Term of patent 14 years
Int. Cl. D2—*01*
U.S. Cl. D2—3

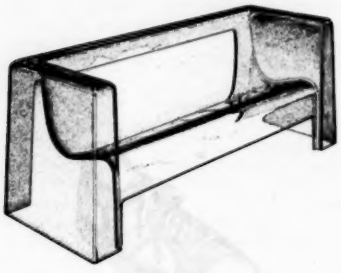
238,983
SPORT SHOE
Jonas Senter, New York, N.Y., assignor to CITC Industries Inc., New York, N.Y.
Filed Nov. 8, 1974, Ser. No. 522,247
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—310

238,984
SPORT SHOE
Jonas Senter, New York, N.Y., assignor to CITC Industries Inc., New York, N.Y.
Filed Nov. 12, 1974, Ser. No. 523,062
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—310

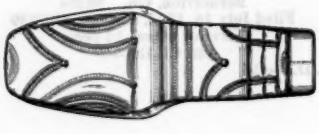
238,985
ZIPPER OPERATOR
James R. Cloud, Sr., P.O. Box 339, Barnesville, Ga. 30204
Filed July 26, 1974, Ser. No. 492,259
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—415



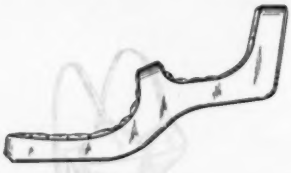
238,986
TOY LOUNGE SEAT OR SIMILAR ARTICLE
Marion D. Owens, Denver, Colo.
(890 Reed Court, Lakewood, Colo. 80215)
Continuation of design applications Ser. No. 305,903 and Ser. No. 305,907, both Nov. 13, 1972. This application June 3, 1974, Ser. No. 475,827
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—6



238,987
MOTORCYCLE SEAT
Michael W. Hanagan, Somers, Conn., assignor to Corbin Gentry, Inc., Somersville, Conn.
Filed Sept. 23, 1974, Ser. No. 508,436
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D6—48.1



238,988
MOTORCYCLE SEAT
Michael W. Hanagan, Somers, Conn., assignor to Corbin Gentry, Inc., Somersville, Conn.
Filed Jan. 3, 1975, Ser. No. 538,438
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D6—48.1

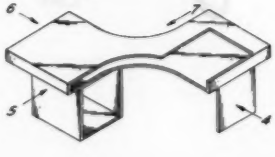


238,989
ARMCHAIR
Raymond Grosfillex, Arbent, France, assignor to Grosfillex S.A.R.L.
Filed Mar. 8, 1972, Ser. No. 233,009
Claims priority, application France Sept. 16, 1971
Term of patent 7 years
Int. Cl. D6—*01*
U.S. Cl. D6—70

238,990
MOBILE CHAIR OR SIMILAR ARTICLE
Rafael A. Galvez, 1255 W. 53rd St., Apt. 106, Hialeah, Fla. 33012
Filed May 6, 1974, Ser. No. 467,597
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—78

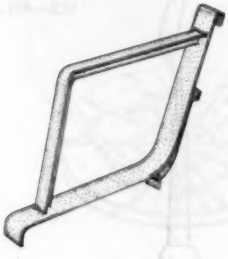
238,991
TABLE
Manuel M. Benavides, 442 Barrett Place, San Antonio, Tex. 78205
Filed Aug. 12, 1974, Ser. No. 496,376
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—113

238,992
COMBINED WORK BENCH AND DESK OR SIMILAR ARTICLE
Stephen U. Winig, Penn Valley, Pa. (400 Fawnhill Lane, Narbeth, Pa. 19072)
Filed Nov. 19, 1973, Ser. No. 417,034
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—161

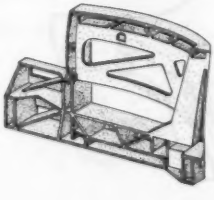


238,993
END CAP FOR A STADIUM SEAT
Wilmer R. Schultz, 1540 Chestnut St., Emmaus, Pa. 18049
Filed Apr. 1, 1974, Ser. No. 456,634
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—191

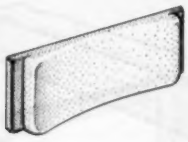
238,994
COMBINED CLAMP DOWN, BACK SUPPORT, ARM AND SLANTED ARM SUPPORT FOR A STADIUM SEAT
Wilmer R. Schultz, 1540 Chestnut St., Emmaus, Pa. 18049
Filed Apr. 1, 1974, Ser. No. 456,636
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—194



238,995
FURNITURE SUBFRAME
William R. Curtis, Eagle Glen, New Castle, and David C. Trimble, Yorklyn, Del., assignors to Hercules Incorporated, Wilmington, Del.
Filed Sept. 17, 1974, Ser. No. 506,821
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—195



238,996
BACK FOR A STADIUM SEAT
Wilmer R. Schultz, 1540 Chestnut St., Emmaus, Pa. 18049
Filed Apr. 1, 1974, Ser. No. 456,633
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—197

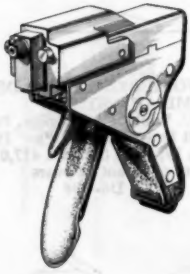


238,997
SPOON OR SIMILAR ARTICLE OF FLATWARE
Ronald Sneidman, 66 Calvin Ave., Syosset Estates, N.Y. 11791
Original design application Mar. 11, 1974, Ser. No. 450,129. Divided and this application Apr. 23, 1975, Ser. No. 570,678
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—137

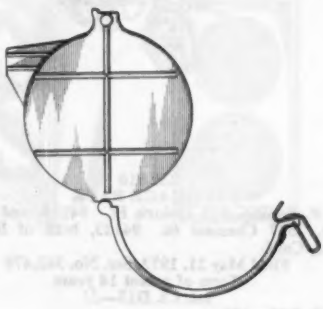
238,998
HANDLE FOR A GRASS SHEAR
Dieter Raffler and Franco Clivio, Ulm, Germany, assignors to Gardena Kress & Kastner GmbH
Filed Apr. 3, 1974, Ser. No. 457,713
Claims priority, application Germany Oct. 4, 1973
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—8

238,999
WRENCH FOR CAMERA LENS, FILTERS AND THREAD ADAPTORS
Jody L. Numbers, 2202 S. Priest, Suite 102, Tempe, Ariz. 85282
Filed Apr. 29, 1974, Ser. No. 465,372
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—17

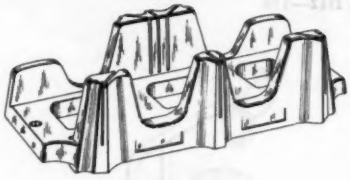
239,000
RIVET GUN
Gabriel M. La Pointe, Worcester, Mass., assignor to Parker Manufacturing Company, Worcester, Mass.
Filed June 21, 1974, Ser. No. 481,495
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—51



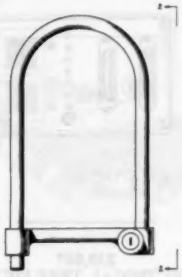
239,001
MAGAZINE FOR HOLDING A SUPPLY OF FASTENERS FOR A FASTENER DRIVING TOOL
Andrew I. Yohana, Des Plaines, Ill., assignor to Duo-Fast Corporation, Franklin Park, Ill.
Filed Apr. 29, 1974, Ser. No. 464,911
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—70



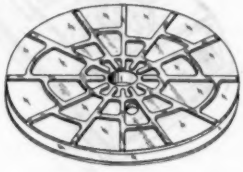
239,002
MITRE BOX
William J. Hildebrandt, West Simsbury, and Richard H. Russell, Farmington, Conn., assignors to The Stanley Works, New Britain, Conn.
Filed Nov. 27, 1974, Ser. No. 527,542
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—71



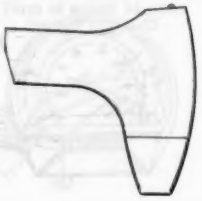
239,003
BICYCLE LOCK
Raymond N. Seakan, Randolph, Mass., assignor to Acro-Fab Industries, Inc., Stoughton, Mass.
Filed May 16, 1974, Ser. No. 470,336
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—114



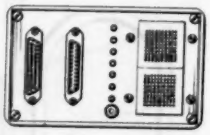
239,004
REEL FOR THIN METALLIC OR SIMILAR MATERIALS
Edward R. Chope, Trenton, Mich., assignor to W. M. Chace Company, Detroit, Mich.
Filed July 3, 1974, Ser. No. 485,331
Term of patent 3½ years
Int. Cl. D8—*99*; D16—*05*
U.S. Cl. D8—220



239,005
HAND HELD OPTICAL CHARACTER RECOGNITION SCANNING UNIT
Robert B. Koenig, Dallas, Tex., assignor to Recognition Equipment, Incorporated, Irving, Tex.
Filed Sept. 26, 1974, Ser. No. 509,711
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—46

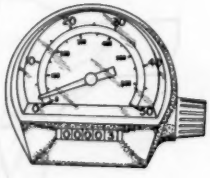


239,006
ELECTRONIC TEST INSTRUMENT
Stephen H. Kelley, 1471 Timberwood Lane, St. Louis, Mo. 63141
Filed Dec. 27, 1973, Ser. No. 428,878
Term of patent 3½ years
Int. Cl. D10—*04*
U.S. Cl. D10—75



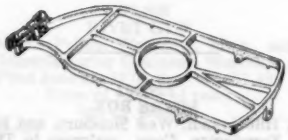
239,007
ELECTRICAL TEST METER
Yoshikazu Kato, 18–3, 1 Tamagawa-cho, Akishima, Tokyo, Japan
Filed Jan. 17, 1974, Ser. No. 434,111
Claims priority, application Japan July 25, 1973
Term of patent 7 years
Int. Cl. D10—*04*
U.S. Cl. D10—75

239,008
COMBINED SPEEDOMETER AND RESET ODOMETER
Howard J. Rasmussen, Chicago, Ill., assignor to Stewart-Warner Corporation, Chicago, Ill.
Filed Feb. 12, 1974, Ser. No. 441,836
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—98



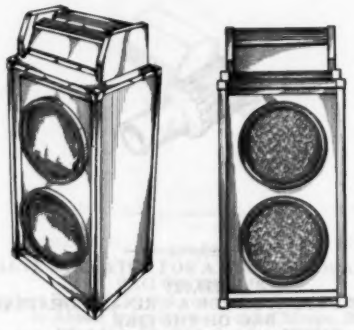
239,009
BICYCLE OR THE LIKE
Eiichi Izuhara, Yokohama, and Tomohiro Ohira, Tokyo, Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan
Filed June 20, 1974, Ser. No. 481,229
Claims priority, application Japan Dec. 21, 1973
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—111

239,010
LUGGAGE RACK
Peter F. Supino, 843 Doloris St. 94110, and Phillip J. Fox, 2547 Chestnut St. 94123, both of San Francisco, Calif.
Filed May 21, 1973, Ser. No. 362,476
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—158



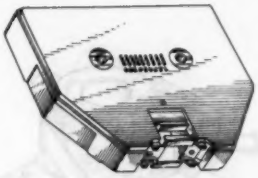
239,011
HANDLEBAR EXTENDER
Paul A. Hamasaka, 2322 Amherst Ave., Los Angeles, Calif. 90064
Filed Sept. 23, 1974, Ser. No. 508,383
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—178

239,012
COMBINED LOUDSPEAKER ENCLOSURE AND AMPLIFIER HOUSING
Charles A. Ross, Fort Scott, Kans., assignor to Reed Electronics, Inc., Fort Scott, Kans.
Filed Dec. 16, 1974, Ser. No. 533,006
Term of patent 14 years
Int. Cl. D14—*01, 03*
U.S. Cl. D26—14 G



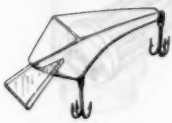
239,013
SOLDERING IRON HOLDER
Richard O. Spencer, South Laguna, Calif., assignor to Eldon Industries, Inc., Hawthorne, Calif.
Filed Jan. 6, 1975, Ser. No. 538,533
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—71

239,014
FILM CARTRIDGE OR SIMILAR ARTICLE
Heinz E. Hertel, Mount Prospect, and Anastasios J. Vasilatos, Wilmette, Ill., assignors to Bell & Howell Company, Chicago, Ill.
Filed Aug. 16, 1974, Ser. No. 498,792
Term of patent 14 years
Int. Cl. D16—*99*
U.S. Cl. D61—1 T

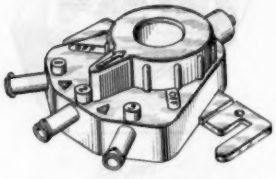


239,015
FISHING STAND
Alvin L. Stout, San Antonio, Tex., assignor to Ellis M. Wilson, San Antonio, Tex.
Filed June 24, 1974, Ser. No. 482,248
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—13

239,016
ARTIFICIAL FISHING LURE
Robert K. Harris, Charlotte, N.C., assignor to Ringley & Crockett, Inc., Charlotte, N.C.
Filed Sept. 27, 1974, Ser. No. 509,791
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—28



239,017
SIX-WAY STOPCOCK
Robert L. Fuson, North Branch, N.J., and Wesley S. Larson, Enfield, Conn., assignors to Ethicon, Inc., Somerville, N.J.
Filed Sept. 26, 1974, Ser. No. 509,361
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—38



239,018
VALVE ACTUATOR FOR A URINARY DRAINAGE BAG OR THE LIKE
Kenneth Howard Knox, Libertyville, Ill., assignor to Abbott Laboratories, North Chicago, Ill.
Filed Feb. 25, 1975, Ser. No. 552,811
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—19

239,019
VALVE ACTUATOR FOR A URINARY DRAINAGE BAG OR THE LIKE
Robert Dyall Flinn, Libertyville, Ill., assignor to Abbott Laboratories, North Chicago, Ill.
Filed Feb. 25, 1975, Ser. No. 552,812
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—19

239,020
VALVE ACTUATOR FOR A URINARY DRAINAGE BAG OR THE LIKE
James Gordon Manschot, Mukwonago, Wis., and Kenneth Howard Knox and Robert Dyall Flinn, Libertyville, Ill., assignors to Abbott Laboratories, North Chicago, Ill.
Filed Feb. 25, 1975, Ser. No. 552,920
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—19

239,021
VALVE ACTUATOR FOR A URINARY DRAINAGE BAG OR THE LIKE
Herbert Fred D'Alo, Oakwood Hills, Cary, Ill., assignor to Abbott Laboratories, North Chicago, Ill.
Filed Feb. 25, 1975, Ser. No. 553,054
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—19

239,022
VALVE ACTUATOR FOR A URINARY DRAINAGE BAG OR THE LIKE
Herbert Fred D'Alo, Oakwood Hills, Cary, Ill., assignor to Abbott Laboratories, North Chicago, Ill.
Filed Feb. 25, 1975, Ser. No. 553,055
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—19

239,023
VALVE ACTUATOR FOR A URINARY DRAINAGE BAG OR THE LIKE
Herbert Fred D'Alo, Oakwood Hills, Cary, Ill., assignor to Abbott Laboratories, North Chicago, Ill.
Filed Feb. 25, 1975, Ser. No. 553,056
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—19

239,024
VALVE ACTUATOR FOR A URINARY DRAINAGE BAG OR THE LIKE
Herbert Fred D'Alo, Oakwood Hills, Cary, Ill., assignor to Abbott Laboratories, North Chicago, Ill.
Filed Feb. 25, 1975, Ser. No. 553,057
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—19

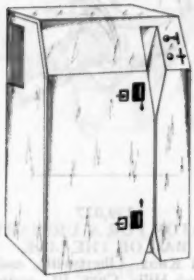
239,025
VALVE ACTUATOR FOR A URINARY DRAINAGE BAG OR THE LIKE
Herbert Fred D'Alo, Oakwood Hills, Cary, Ill., assignor to Abbott Laboratories, North Chicago, Ill.
Filed Feb. 25, 1975, Ser. No. 553,058
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—19

239,026
VALVE ACTUATOR FOR A URINARY DRAINAGE BAG OR THE LIKE
Kenneth Howard Knox, Libertyville, and Herbert Fred D'Alo, Oakwood Hills, Cary, Ill., assignors to Abbott Laboratories, North Chicago, Ill.
Filed Feb. 25, 1975, Ser. No. 553,059
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—19

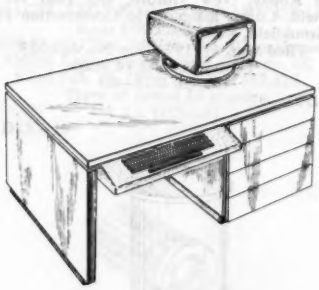
239,027
VALVE ACTUATOR FOR A URINARY DRAINAGE BAG OR THE LIKE
Kenneth Howard Knox, Libertyville, and Herbert Fred D'Alo, Oakwood Hills, Cary, Ill., assignors to Abbott Laboratories, North Chicago, Ill.
Filed Feb. 25, 1975, Ser. No. 553,060
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—19

239,028
FREE-STANDING INDOOR STOVE
Manfred J. Weber and Dennis W. Rothe, Brookfield, Gerald Kopke, New Milford, and Paul W. Weber, Ridgefield, Conn., assignors to Construction Products, Inc., Brookfield, Conn.
Filed Mar. 11, 1974, Ser. No. 449,925
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97

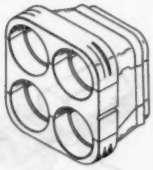
239,029
MAGNETIC STRIPE CARD READER OR THE LIKE
Ronald I. Conway, Port Ewen, Robert V. Jones, Kingston, John J. Natoli, Woodstock, and John V. Stram, Poughkeepsie, N.Y., assignors to International Business Machines Corp., Armonk, N.Y.
Filed July 16, 1973, Ser. No. 379,879
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



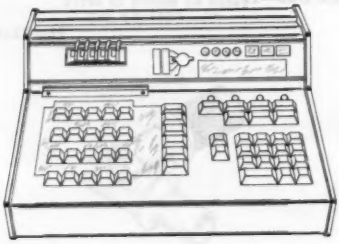
239,030
RECORD COMMUNICATIONS TERMINAL
Donald M. Genaro, Haworth, N.J., and Arthur A. Hagstrom, Hoffman Estates, and Charles R. Winston, Deerfield, Ill., assignors to Teletype Corporation, Skokie, Ill.
Filed Jan. 16, 1974, Ser. No. 433,938
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



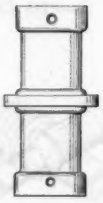
239,031
CONDUIT ADAPTER
John R. Madlem, Box 136A3 High Falls Road, R.D. 1, Catskill, N.Y. 12414
Filed Mar. 26, 1974, Ser. No. 455,216
Term of patent 14 years
Int. Cl. D13—*03*; D23—*01*
U.S. Cl. D26—5 B



239,032
CONSOLE FOR COST ESTIMATION DATA PROCESSOR
Richard Anderson, Los Altos, Calif., assignor to Varian Associates, Palo Alto, Calif.
Filed Oct. 10, 1974, Ser. No. 513,679
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C

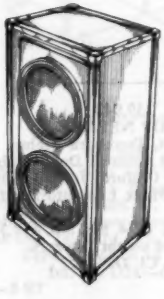


239,033
SINGLE POLE-DOUBLE THROW SWITCH STRUCTURE
Ted N. Tilman, 3538 Telegraph Drive, San Jose, Calif. 95132
Filed May 9, 1974, Ser. No. 468,567
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13 R



239,034
TELEPHONE HANDSET HANGER
Ned T. Stilgenbauer, 1690 Summit Hills Drive, Cincinnati, Ohio 45230
Filed June 27, 1974, Ser. No. 483,680
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 A

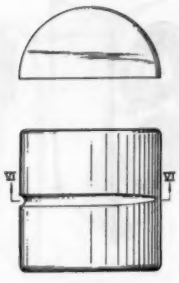
239,035
LOUDSPEAKER ENCLOSURE
Charles A. Ross, Fort Scott, Kans., assignor to Road Electronics, Inc., Fort Scott, Kans.
Filed Dec. 16, 1974, Ser. No. 533,007
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14 G



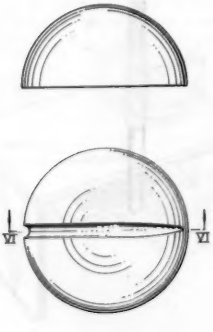
239,036
LOUDSPEAKER ENCLOSURE
Charles A. Ross, Fort Scott, Kans., assignor to Road Electronics, Inc., Fort Scott, Kans.
Filed Dec. 16, 1974, Ser. No. 533,066
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14 G

239,037
COMBINED BALL POINT PEN AND LIGHTER
Taro Yanai, 6–15 Ohtemachi, 3-chome, Maebashi-shi, Gunma-ken, Japan
Filed Apr. 17, 1973, Ser. No. 352,025
Term of patent 14 years
Int. Cl. D19—*06;* D27—*05*
U.S. Cl. D27—38

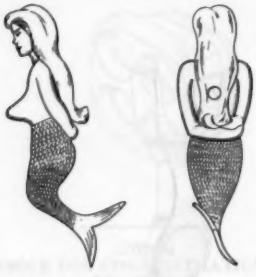
239,038
TENNIS POST CAP
Brian Frederick Hirst, Halifax, England, assignor to B. Hirst & Sons Limited
Filed Oct. 23, 1973, Ser. No. 408,563
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D28—1 C



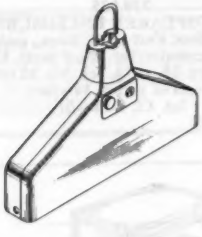
239,039
TENNIS POST CAP
Brian Frederick Hirst, Halifax, England, assignor to B. Hirst & Sons Limited
Filed Oct. 23, 1973, Ser. No. 408,566
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D28—1 C



239,040
FISH FEEDER OR THE LIKE
Robert F. Evans, P.O. Box 62, La Mirada, Calif. 90637
Filed July 15, 1974, Ser. No. 488,723
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—13



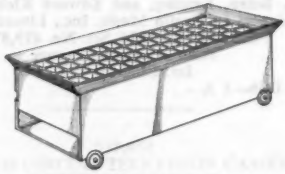
239,041
PORTABLE SECURITY CONTAINER
Morton K. Rubinstein, 14954 Corona Del Mar, Pacific Palisades, Calif. 90272
Filed Oct. 15, 1974, Ser. No. 514,497
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D31—22



239,042
LOOP NEEDLE
Ronald Freake, Elkhart, Devendra Mehta, South Bend, and Mau H. Kuo and Kenneth Dale Collister, Elkhart, Ind., and Leighton Clifford Johnson, Edwardsburg, Mich., assignors to Miles Laboratories, Inc., Elkhart, Ind.
Filed June 14, 1974, Ser. No. 479,314
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D32—1 R

239,043
DOLL
Pamala A. Lander, 4060 Andedon Circle, Sacramento, Calif. 95826
Filed May 30, 1973, Ser. No. 365,068
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—4 C

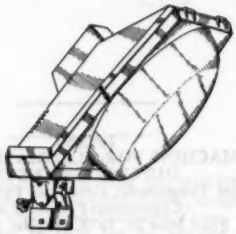
239,044
MOBILE TARGET FOR A GAME INVOLVING SKILL
Lendon E. Jackson, Sepulveda, Calif. (7055 Lenox Ave., Apt. 342, Van Nuys, Calif. 91405)
Filed Sept. 17, 1973, Ser. No. 397,962
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 PP



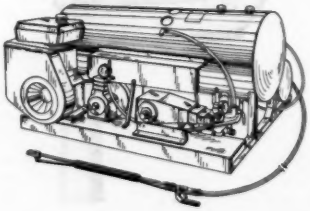
239,045
COMBINED RACKET COVER AND PRESS
Christopher T. Rood, 3561 Bayard Drive, Cincinnati, Ohio 45208, and Howard H. McIlvain, Cincinnati, Ohio; said McIlvain assignor to said Rood
Filed Oct. 24, 1974, Ser. No. 517,583
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 ST

239,046
EAR WIRE
Ralph Pintarelli, 600 Manton Ave., Providence, R.I. 02909
Filed Feb. 4, 1974, Ser. No. 439,593
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—9

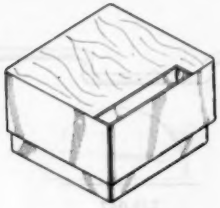
239,047
LUMINAIRE
James Tatsuo Asaki, Elyria, Ohio, assignor to International Telephone & Telegraph Corp., New York, N.Y.
Filed June 19, 1974, Ser. No. 480,960
Term of patent 14 years
Int. Cl. D26—*03*
U.S. Cl. D48—31



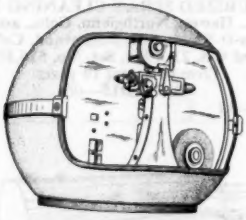
239,048
PRESSURIZED SPRAY CLEANING UNIT
Charley L. Hewett, Northglenn, Colo., assignor to Kem-O-Kleen, Inc., Englewood, Colo.
Filed Oct. 21, 1974, Ser. No. 516,379
Term of patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D49—11



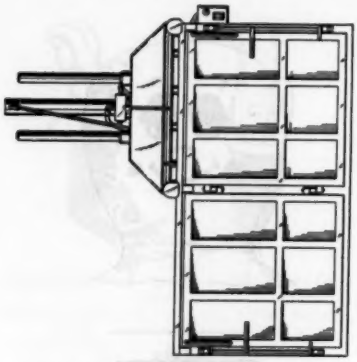
239,049
TOOTHPICK DISPENSER
Darrell D. Fish, Timonium, Md., assignor to Universal Synergetics, Inc., Pennsauken, N.J.
Filed May 28, 1974, Ser. No. 473,404
Term of patent 14 years
Int. Cl. D20—*99*
U.S. Cl. D52—2 B



239,050
MACHINE FOR AUTOMATICALLY DUPLICATING KEYS
Serge Paul Crasnianski, Grenoble, France, assignor to Crasnianski-France, S.A.
Filed June 29, 1973, Ser. No. 374,994
Claims priority, application France Feb. 13, 1973
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D55—1 A

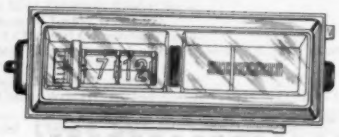


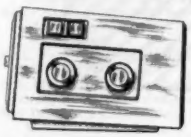
239,051
WASTE PAPER PRESS
Bengt A. F. Andersson, 11 Gyllensvardsgatan, S-302 34 Halmstad, Sweden
Filed Jan. 28, 1975, Ser. No. 544,696
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D55—1 B



239,052
ELECTRIC GUITAR OR SIMILAR ARTICLE
Bruce J. Bolen, Lansing, and Edward Klein, Wilmette, Ill., assignors to Norlin Music, Inc., Lincolnwood, Ill.
Filed Aug. 22, 1974, Ser. No. 499,574
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D56—1 A

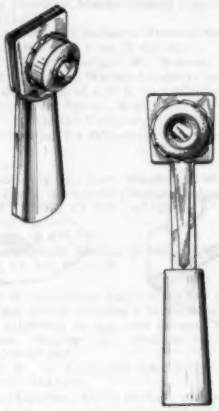
239,053
CLOCK RADIO
Cornelius W. Christie, Jr., Fulton, N.Y., assignor to General Electric Company, Syracuse, N.Y.
Filed Apr. 10, 1974, Ser. No. 459,859
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B



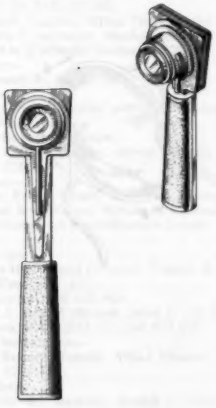


239,054
CLOSED CIRCUIT TELEVISION CAMERA EXTERIOR HOUSING
Raymond V. Pagano, Doraville, Ga., assignor to L.N.P. & Associates
Filed Apr. 12, 1974, Ser. No. 460,431
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D61—1 Q

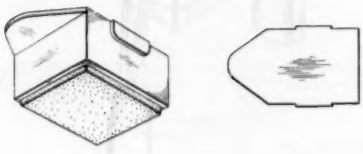
239,055
HAND-HELD VIEWER FOR MICROFORMS
Robert G. Holliday, Ann Arbor, Mich., assignor to Xerox Corporation, Stamford, Conn.
Filed Mar. 25, 1975, Ser. No. 561,805
Term of patent 14 years
Int. Cl. D16—*04;* D24—*02*
U.S. Cl. D61—1 J



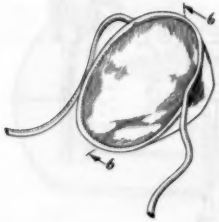
239,056
HAND-HELD VIEWER FOR MICROFORMS
Robert G. Holliday, Ann Arbor, Mich., assignor to Xerox Corporation, Stamford, Conn.
Filed Mar. 25, 1975, Ser. No. 561,806
Term of patent 14 years
Int. Cl. D16—*04;* D24—*02*
U.S. Cl. D61—1 J



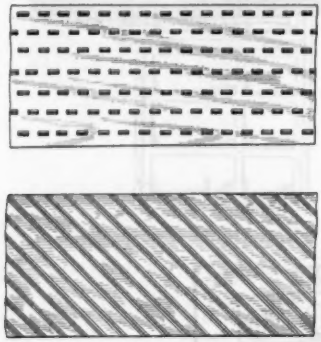
239,057
INK CARTRIDGE
William F. Utzinger, Kettering, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio
Filed Sept. 9, 1974, Ser. No. 503,024
Term of patent 14 years
Int. Cl. D18—*02*
U.S. Cl. D64—10



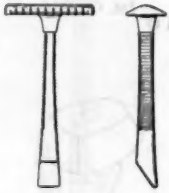
239,058
PROTECTIVE PAD FOR BEDRIDDEN PATIENTS
John F. Gaylord, Jr., Matthews, N.C., assignor to Medical Specialties, Inc., Charlotte, N.C.
Filed Dec. 18, 1974, Ser. No. 533,798
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D83—1 J



239,059
MEDICAL SEMI-PERMEABLE MEMBRANE SUPPORT
Ferris E. Newman, Libertyville, Ill., assignor to Baxter Laboratories, Inc., Deerfield, Ill.
Filed Jan. 24, 1975, Ser. No. 543,748
Term of patent 14 years
Int. Cl. D23—*01*; D24—*02*
U.S. Cl. D83—1 F



239,060
SAFETY RAZOR
Arnold E. Rees, Blyth, England, assignor to Wilkinson Sword Limited
Filed July 8, 1974, Ser. No. 486,358
Claims priority, application Great Britain Jan. 16, 1974
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D95—3 A



INDEX OF APPLICANTS AND ASSIGNEES

OF

PATENT APPLICATIONS PUBLISHED ON THE 2ND DAY OF MARCH, 1976

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Abe, Osamu: *See—*
Morimoto, Shinichiro; and Abe, Osamu, B 492,716.

Adams, Jim Mills; and DeZabala, Edward Francis, to Hoffmann-La Roche Inc. Apparatus for high-speed accurate counting and handling of discrete objects such as tablets. B 453,238, Cl. 214-1.00C.

Aepli, Otto T.: *See—*
Sorgenfrei, Malachi E.; and Aepli, Otto T., B 520,546.

Aisin Seiki Kabushiki Kaisha: *See—*
Kondo, Toshio, B 501,975.

Allied Chemical Corporation: *See—*
Stephenson, Robert L.; Pfeiffer, Robert C.; and Loomba, Yogendra Singh, B 487,427.

Ammons, Vernon G.: *See—*
Chang, Wen-Hsuan; and Ammons, Vernon G., B 474,645.

Ashton, Stanley; Laithwaite, Peter; and Taylor, John Anthony, to Imperial Chemical Industries Limited. Vulcanisation process. B 546,149, Cl. 260-79.50P.

Balcewicz, Joseph Francis, to RCA Corporation. Minimum shift keying communication system. B 498,775, Cl. 178-66.00R.

Barzynski, Helmut; and Richter, Peter, to BASF Aktiengesellschaft. Method for the production of printing plates using photosensitive compositions. B 437,894, Cl. 96-33.000.

BASF Aktiengesellschaft: *See—*
Barzynski, Helmut; and Richter, Peter, B 437,894.
Beck, Fritz, B 511,665.
Hetzel, Eckhard; Vogel, Ludwig; Rotermund, Gerhard; and Horn, Hans Christoph, B 486,678.

BASF Wyandotte Corporation: *See—*
Ladha, Kamal K.; Herring, William M.; and Louvar, Joseph F., B 524,806.
Sorgenfrei, Malachi E.; and Aepli, Otto T., B 520,546.

Bayer Aktiengesellschaft: *See—*
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, B 445,166.

Beck, Fritz, to BASF Aktiengesellschaft. Lead batteries. B 511,665, Cl. 136-26.000.

Bell, Malcolm R., to Sterling Drug Co. Certain 1,2-diphenyl-1,2,3,4-tetrahydroquinoline compounds. B 402,162, Cl. 260-288.00R.

Bell Telephone Laboratories, Incorporated: *See—*
Moran, John Christian, B 533,454.

Biber, Conrad H., to Polaroid Corporation. Single trigger photographic strobe unit. B 501,503, Cl. 315-241.00P.

Bode, Charles H., Jr.; and Gallucci, Francis, to United States Steel Corporation. Horizontal roll-rack for continuous casting. B 396,916, Cl. 164-282.000.

Boehringer Mannheim G.m.b.H.: *See—*
Wiedemann, Fritz; Thiel, Max; Stach, Kurt; Dietmann, Karl; and Sponer, Gisbert, B 487,423.

Borenstein, Benjamin; and Cort, Winifred, to Hoffmann-La Roche Inc. Vitamin compositions. B 493,950, Cl. 426-73.000.

Bossert, Friedrich: *See—*
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, B 445,166.

Bosso, Joseph F.; and Wismer, Marco, to PPG Industries, Inc. Electrodeposition of epoxy compositions. B 167,470, Cl. 204-181.000.

Bosso, Joseph F.; and Wismer, Marco, to PPG Industries, Inc. Method of producing epoxy group-containing, quaternary ammonium salt-containing resins. B 455,686, Cl. 260-29.2EP.

Brault, Albert T.: *See—*
Ciurca, Samuel J., Jr.; and Brault, Albert T., B 367,305.

Breese, Maurice Earl, to RCA Corporation. Monopulse radar system. B 497,702, Cl. 343-8.000.

Breno, Philip J.: *See—*
Watson, Barry; and Breno, Philip J., B 511,002.

Brockett, Frank Howard, III, to International Nickel Company, Inc., The. Mining transition chamber. B 531,753, Cl. 37-57.000.

Brown, Harry W., to Cutler-Hammer, Inc. Multiple circuit slide selector switch having fixed contact retaining band. B 480,740, Cl. 200-16.00C.

Brundage, Ruth Pauline: *See—*
Carabateas, Philip M.; and Brundage, Ruth Pauline, B 445,493.

Campbell, John A.; Dezelan, Joseph E.; and Hart, Cullen P., to Caterpillar Tractor Co. Auxiliary hydrostatic front wheel drive system. B 432,969, Cl. 180-44.00F.

Carabateas, Philip M.; and Brundage, Ruth Pauline, to Sterling Drug Inc. Preparation of 4-(3-nitrophenyl)pyridine. B 445,493, Cl. 260-290.00R.

Caterpillar Tractor Co.: *See—*
Campbell, John A.; Dezelan, Joseph E.; and Hart, Cullen P., B 432,969.

Chang, Wen-Hsuan; and Ammons, Vernon G., to PPG Industries, Incorporated. Transparent, non-blooming poly(lactone-urethane) interlayers for laminated safety glass. B 474,645, Cl. 260-77.5 AN.

Ciba-Geigy Corporation: *See—*
Dexter, Martin; and Steinberg, David Herbert, B 532,140.
Seha, Zdenek, B 426,266.

Ciurca, Samuel J., Jr.; and Brault, Albert T. Photographic elements containing N-oxide oxidants. B 367,305, Cl. 96-54.000.

Cole, Gary William: *See—*
Horwath, Robert Otto; Cole, Gary William; and Lally, John Anthony, B 592,146.

Combustion Engineering, Inc.: *See—*
Ward, Charles Theodore; Mathis, Donald Lee; and Radcliff, Frank Taylor, B 415,021.

Commonwealth Scientific and Industrial Research Organization: *See—*
Sasse, Wolfgang Hermann Fritz, B 423,404.

Connor, David T.; Ringel, Samuel M.; Roemer, Sidney; and von Strandtmann, Maximilian, to Warner-Lambert Company. Octahydro and decahydro derivatives of acid S, an antibiotic produced by polyangium cellulosum var. fulvum. B 482,058, Cl. 424-122.000.

Cornish, Robert F., to Timken Company, The. Bearing assembly with means for compensating for differential expansion. B 507,661, Cl. 308-207.00R.

Cort, Winifred: *See—*
Borenstein, Benjamin; and Cort, Winifred, B 493,950.

Cumbers, David Charles, to Imperial Chemical Industries Limited. Calender presses. B 432,991, Cl. 100-162.00B.

Cutler-Hammer, Inc.: *See—*
Brown, Harry W., B 480,740.

Cutler, Royal A.; and Schalit, Samuel, to Sterling Drug Inc. Amidinoureas. B 391,473, Cl. 260-553.00R.

Davis, Ralph A.: *See—*
Plonka, James H.; and Davis, Ralph A., B 564,252.

Davis, William J.; and Izbicki, Anthony J. Method for preparing pulverulent polymers exhibiting an apparent increase in glass transition temperature and shaping the resultant polymer materials. B 417,164, Cl. 264-49.000.

Demole, Edouard P., to Firmenich SA. Aromatic compositions. B 586,380, Cl. 131-144.000.

Dexter, Martin; and Steinberg, David Herbert, to Ciba-Geigy Corporation. Hindered hydroxyphenylalkanoates of substituted isopropanols. B 532,140, Cl. 260-473.00S.

DeZabala, Edward Francis: *See—*
Adams, Jim Mills; and DeZabala, Edward Francis, B 453,238.

Dezelan, Joseph E.: *See—*
Campbell, John A.; Dezelan, Joseph E.; and Hart, Cullen P., B 432,969.

Dietmann, Karl: *See—*
Wiedemann, Fritz; Thiel, Max; Stach, Kurt; Dietmann, Karl; and Sponer, Gisbert, B 487,423.

Dow Chemical Company, The: *See—*
Plonka, James H.; and Davis, Ralph A., B 564,252.

Dumesnil, Richard: *See—*
Rouge, Serge; and Dumesnil, Richard, B 574,616.

Elger, Walter: *See—*
Wiechert, Rudolf; Steinbeck, Hermann; and Elger, Walter, B 484,068.

Ethyl Corporation: *See—*
Governale, Luke J.; and Wollensak, John C., B 449,837.
Marsee, Frederick J., B 498,951.
Niebylski, Leonard M., B 551,133.

Fay, Charles Robert, to Formica Corporation. Web penetration control. B 520,063, Cl. 235-151.100.

Fay, Charles Robert; Guertin, Alfred Thomas; and Stinson, John William, to Formica Corporation. Method and apparatus for the feed forward control of a material treater. B 520,076, Cl. 235-151.100.

Firmenich SA: *See—*
Demole, Edouard P., B 586,380.

Forgo, Laszlo: *See—*
Heller, Laszlo; Forgo, Laszlo; and Frank, Gyorgy, B 505,689.

Formica Corporation: *See—*
Fay, Charles Robert, B 520,063.
Fay, Charles Robert; Guertin, Alfred Thomas; and Stinson, John William, B 520,076.

Frank, Gyorgy: *See—*
Heller, Laszlo; Forgo, Laszlo; and Frank, Gyorgy, B 505,689.

Fryer, Rodney Ian; and Walser, Armin, to Hoffmann-La Roche Inc. 7-Azoxy substituted-1,4-benzodiazepin-2-ones. B 419,582, Cl. 260-143.000.

Gallucci, Francis: *See—*
Bode, Charles H., Jr.; and Gallucci, Francis, B 396,916.

General Electric Company: *See—*
Ouellette, Maurice J., B 428,408.

Governale, Luke J.; and Wollensak, John C., to Ethyl Corporation. Chemical process. B 449,837, Cl. 260-578.000.

Guertin, Alfred Thomas: *See—*
Fay, Charles Robert; Guertin, Alfred Thomas; and Stinson, John William, B 520,076.

Hart, Cullen P.: *See—*
Campbell, John A.; Dezelan, Joseph E.; and Hart, Cullen P., B 432,969.

Heller, Laszlo; Forgo, Laszlo; and Frank, Gyorgy, to Transelektro Magyar Villamossagi Kulkereskedelmi Vallalat. Method and apparatus for cooling heat engines. B 505,689, Cl. 60-690.000.

Herring, William M.: *See—*
Ladha, Kamal K.; Herring, William M.; and Louvar, Joseph F., B 524,806.

Hershman, Arnold; and Pearson, Anthony J. C., to Monsanto Company. Repression of polymer formation in the conversion of linear or branched primary diamines to cyclic imines. B 470,900, Cl. 260-239.00B.

Hetzel, Eckhard; Vogel, Ludwig; Rotermund, Gerhard; and Horn, Hans Christoph, to BASF Aktiengesellschaft. Continuous manufacture of phthalimide. B 486,678, Cl. 260-326.00R.

Hoffmann-La Roche Inc.: *See—*
Adams, Jim Mills; and DeZabala, Edward Francis, B 453,238.
Borenstein, Benjamin; and Cort, Winifred, B 493,950.
Fryer, Rodney Ian; and Walser, Armin, B 419,582.
Wehrli, Pius Anton, B 480,662.

Horn, Hans Christoph: *See—*
Hetzel, Eckhard; Vogel, Ludwig; Rotermund, Gerhard; and Horn, Hans Christoph, B 486,678.

Horwath, Robert Otto; and Rotheim, Philip, to Standard Brands Incorporated. Process for producing isoamylase. B 566,585, Cl. 195-65.000.

Horwath, Robert Otto; Cole, Gary William; and Lally, John Anthony, to Standard Brands Incorporated. Process for producing isoamylase. B 592,146, Cl. 195-65.000.

Hussey, Eugene H., to Polymer Corporation, The. Long-wearing plastic bearings. B 559,142, Cl. 252-12.000.

ICI Australia Limited: *See—*
Sasse, Wolfgang Hermann Fritz, B 423,404.

Igaki, Yasuyuki: *See—*
Mori, Yubi; Igaki, Yasuyuki; and Sugahara, Syunji, B 484,332.

Imperial Chemical Industries Limited: *See—*
Ashton, Stanley; Laithwaite, Peter; and Taylor, John Anthony, B 546,149.
Cumbers, David Charles, B 432,991.

International Business Machines Corporation: *See—*
Nelson, George N.; Talke, Frank E.; and Tseng, Raymond C., B 458,964.

International Nickel Company, Inc., The: *See—*
Brockett, Frank Howard, III, B 531,753.

Ivester, Andrew S.; and Marchese, James J., to Polaroid Corporation. Film cassette loading door latch and interlock switch for photographic apparatus. B 502,161, Cl. 354-174.000.

Izbicki, Anthony J.: *See—*
Davis, William J.; and Izbicki, Anthony J., B 417,164.

Kathawala, Faizulla G., to Sandoz, Inc. Substituted 2-(4-phenoxyphenyl)-2-tertiary butyl-1,3-dioxalanes. B 521,643, Cl. 260-340.900.

Keegan, James J.; Patel, Girish; and Rubin, Howard, to Warner-Lambert Company. Anhydrous products having improved wettability characteristics. B 530,580, Cl. 260-17.4ST.

Keyes, Melvin H., to Owens-Illinois, Inc. Immobilization of enzymes on an inorganic matrix. B 395,975, Cl. 195-68.000.

Kobayashi, Kazuhiko: *See—*
Saito, Nagao; Kobayashi, Kazuhiko; and Oizumi, Toshiro, B 426,227.

Kondo, Toshio, to Aisin Seiki Kabushiki Kaisha. Flexible sealing boot. B 501,975, Cl. 74-18.200.

Kurita Water Industries Ltd.: *See—*
Morimoto, Shinichiro; and Abe, Osamu, B 492,716.

Ladha, Kamal K.; Herring, William M.; and Louvar, Joseph F., to BASF Wyandotte Corporation. Method and apparatus for purifying aqueous streams contaminated with organic materials. B 524,806, Cl. 210-23.00H.

Laithwaite, Peter: *See—*
Ashton, Stanley; Laithwaite, Peter; and Taylor, John Anthony, B 546,149.

Lally, John Anthony: *See—*
Horwath, Robert Otto; Cole, Gary William; and Lally, John Anthony, B 592,146.

Lockheed Missiles & Space Company, Inc.: *See—*
Parmley, Richard T., B 421,975.

Lockwood, Robert J.; and Roess, Richard H., to Upjohn Company, The. Catalyst for sprayable polyisocyanurate foam composition. B 486,828, Cl. 260-2.5AW.

Loomba, Yogendra Singh: *See—*
Stephenson, Robert L.; Pfeiffer, Robert C.; and Loomba, Yogendra Singh, B 487,427.

Louvar, Joseph F.: *See—*
Ladha, Kamal K.; Herring, William M.; and Louvar, Joseph F., B 524,806.

Lucchesi, Benedict R., to University of Michigan, The Regents of the. Novel quaternary salts and method. B 480,114, Cl. 260-567.60M.

Ludwig Merckle KG: *See—*
Metz, Gunter; and Specker, Manfred, B 491,052.

Marchese, James J.: *See—*
Ivester, Andrew S.; and Marchese, James J., B 502,161.

Marsee, Frederick J., to Ethyl Corporation. Fuel induction system. B 498,951, Cl. 123-122.0AC.

Mathis, Donald Lee: *See—*
Ward, Charles Theodore; Mathis, Donald Lee; and Radcliff, Frank Taylor, B 415,021.

Matsushita Electric Industrial Co., Ltd.: *See—*
Mori, Yubi; Igaki, Yasuyuki; and Sugahara, Syunji, B 484,332.

McCombs, Howard L. Control apparatus particularly for a plurality of compressor bleed valves of a gas turbine engine. B 490,623, Cl. 137-608.000.

Metz, Gunter; and Specker, Manfred, to Ludwig Merckle KG. Phenoxyalkane carboxylic acid derivative. B 491,052, Cl. 260-472.000.

Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, to Bayer Aktiengesellschaft. 2-Amino-3,4-dihydropyridines. B 445,166, Cl. 260-294.80G.

Minnich, Violet C., to United States of America, Army. Pop-up fin. B 510,521, Cl. 244-3.270.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Saito, Nagao; Kobayashi, Kazuhiko; and Oizumi, Toshiro, B 426,227.

Monsanto Company: *See—*
Hershman, Arnold; and Pearson, Anthony J. C., B 470,900.

Moran, John Christian, to Bell Telephone Laboratories, Incorporated. Shift and rotate circuit for a data processor. B 533,454, Cl. 340-172.500.

Mori, Yubi; Igaki, Yasuyuki; and Sugahara, Syunji, to Matsushita Electric Industrial Co., Ltd. Fluid servicing unit for automatic fastener feeding and driving apparatus. B 484,332, Cl. 144-32.00R.

Morimoto, Shinichiro; and Abe, Osamu, to Kurita Water Industries Ltd. Apparatus for filtration. B 492,716, Cl. 210-189.000.

Nelson, George N.; Talke, Frank E.; and Tseng, Raymond C., to International Business Machines Corporation. Rotary air bearing head with leading edge controlling air bearing. B 458,964, Cl. 360-102.000.

Niebylski, Leonard M., to Ethyl Corporation. Exhaust systems. B 551,133, Cl. 60-299.000.

Nissan Motor Co., Ltd.: *See—*
Suda, Seiji, B 480,473.
Suda, Seiji, B 480,473.

Ohashi, Shigeo. Switch with rocker actuator having detachable cover. B 470,899, Cl. 200-309.000.

Oizumi, Toshiro: *See—*
Saito, Nagao; Kobayashi, Kazuhiko; and Oizumi, Toshiro, B 426,227.

Ouellette, Maurice J., to General Electric Company. Data processing arrangement for printers. B 428,408, Cl. 340-146.1AB.

Owens-Illinois, Inc.: *See—*
Keyes, Melvin H., B 395,975.
Watson, Barry; and Breno, Philip J., B 511,002.

Parmley, Richard T., to Lockheed Missiles & Space Company, Inc. Expandable metal membrane. B 421,975, Cl. 29-180.0SS.

Patel, Girish: *See—*
Keegan, James J.; Patel, Girish; and Rubin, Howard, B 530,580.

Patel, Neville K., to Westinghouse Electric Corporation. Moisture control device for steam turbines. B 451,248, Cl. 219-201.000.

Pater, Walter E.: *See—*
Rowley, James R.; and Pater, Walter E., B 371,912.

Pearson, Anthony J. C.: *See—*
Hershman, Arnold; and Pearson, Anthony J. C., B 470,900.

Petersen, Christian C., to Polaroid Corporation. Galvano-magnetic effect control system for photographic apparatus. B 507,131, Cl. 354-156.000.

Pfeiffer, Robert C.: *See—*
Stephenson, Robert L.; Pfeiffer, Robert C.; and Loomba, Yogendra Singh, B 487,427.

Plonka, James H.; and Davis, Ralph A., to Dow Chemical Company, The. Process for production of γ-halonitriles. B 564,252, Cl. 260-465.700.

Polaroid Corporation: *See—*
Biber, Conrad H., B 501,503.
Ivester, Andrew S.; and Marchese, James J., B 502,161.
Petersen, Christian C., B 507,131.

Polymer Corporation, The: *See—*
Hussey, Eugene H., B 559,142.

PPG Industries, Inc.: *See—*
Bosso, Joseph F.; and Wismer, Marco, B 167,470.
Bosso, Joseph F.; and Wismer, Marco, B 455,686.
Chang, Wen-Hsuan; and Ammons, Vernon G., B 474,645.
Rowley, James R.; and Pater, Walter E., B 371,912.

Radcliff, Frank Taylor: *See—*
Ward, Charles Theodore; Mathis, Donald Lee; and Radcliff, Frank Taylor, B 415,021.

RCA Corporation: *See—*
Balcewicz, Joseph Francis, B 498,775.
Breese, Maurice Earl, B 497,702.

Richter, Peter: *See—*
Barzynski, Helmut; and Richter, Peter, B 437,894.

Ringel, Samuel M.: *See—*
Connor, David T.; Ringel, Samuel M.; Roemer, Sidney; and von Strandtmann, Maximilian, B 482,058.

Roemer, Sidney: *See—*
Connor, David T.; Ringel, Samuel M.; Roemer, Sidney; and von Strandtmann, Maximilian, B 482,058.

Roess, Richard H.: *See—*
Lockwood, Robert J.; and Roess, Richard H., B 486,828.

Rotermund, Gerhard: *See—*
Hetzel, Eckhard; Vogel, Ludwig; Rotermund, Gerhard; and Horn, Hans Christoph, B 486,678.

Rotheim, Philip: *See—*
Horwath, Robert Otto; and Rotheim, Philip, B 566,585.

Rouge, Serge; and Dumesnil, Richard, to U.S. Philips Corporation. Drive mechanism for an X-ray anti-scatter grid. B 574,616, Cl. 250-445.00T.

Rowley, James R.; and Pater, Walter E., to PPG Industries, Inc. Shipping bin for sheets with device for restraining movement of the sheets. B 371,912, Cl. 206-451.000.

Rubin, Howard: *See—*
Keegan, James J.; Patel, Girish; and Rubin, Howard, B 530,580.

Saito, Nagao; Kobayashi, Kazuhiko; and Oizumi, Toshiro, to Mitsubishi Denki Kabushiki Kaisha. Method and apparatus for electrical discharge machining. B 426,227, Cl. 219-69.00M.
Sandoz, Inc.: *See—*
Kathawala, Faizulla G., B 521,643.
Sasse, Wolfgang Hermann Fritz, to ICI Australia Limited; and Commonwealth Scientific and Industrial Research Organization. Radiation polymerization of triallylamines using a non-polar, non-hydroxylic solvent. B 423,404, Cl. 204-159.220.
Schalit, Samuel: *See—*
Cutler, Royal A.; and Schalit, Samuel, B 391,473.
Schering Aktiengesellschaft: *See—*
Wiechert, Rudolf; Steinbeck, Hermann; and Elger, Walter, B 484,068.
Seha, Zdenek, to Ciba-Geigy Corporation. Process for the preparation of metal-free phthalocyanine. B 426,266, Cl. 260-314.500.
Sekhar, Neel C., to Upjohn Company, The. Process for inhibiting platelet aggregation. B 514,839, Cl. 195-1.800.
Sekhar, Neel C., to Upjohn Company, The. Process for inhibiting platelet aggregation. B 530,255, Cl. 195-1.800.
Sorgenfrei, Malachi E.; and Aepli, Otto T., to BASF Wyandotte Corporation. Method of washing glassware and inhibited cleaning solution and additive composition useful therein. B 520,546, Cl. 252-156.000.
Specker, Manfred: *See—*
Metz, Gunter; and Specker, Manfred, B 491,052.
Sponer, Gisbert: *See—*
Wiedemann, Fritz; Thiel, Max; Stach, Kurt; Dietmann, Karl; and Sponer, Gisbert, B 487,423.
Stach, Kurt: *See—*
Wiedemann, Fritz; Thiel, Max; Stach, Kurt; Dietmann, Karl; and Sponer, Gisbert, B 487,423.
Standard Brands Incorporated: *See—*
Horwath, Robert Otto; and Rotheim, Philip, B 566,585.
Horwath, Robert Otto; Cole, Gary William; and Lally, John Anthony, B 592,146.
Steinbeck, Hermann: *See—*
Wiechert, Rudolf; Steinbeck, Hermann; and Elger, Walter, B 484,068.
Steinberg, David Herbert: *See—*
Dexter, Martin; and Steinberg, David Herbert, B 532,140.
Stephenson, Robert L.; Pfeiffer, Robert C.; and Loomba, Yogendra Singh, to Allied Chemical Corporation. Vehicle sensitive retractor with improved universal pendulum and gimbal. B 487,427, Cl. 242-107.40A.
Sterling Drug Co.: *See—*
Bell, Malcolm R., B 402,162.
Sterling Drug Inc.: *See—*
Carabateas, Philip M.; and Brundage, Ruth Pauline, B 445,493.
Cutler, Royal A.; and Schalit, Samuel, B 391,473.
Stinson, John William: *See—*
Fay, Charles Robert; Guertin, Alfred Thomas; and Stinson, John William, B 520,076.
Stoepel, Kurt: *See—*
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, B 445,166.
Suda, Seiji, to Nissan Motor Co., Ltd.; and Nissan Motor Co. Ltd. Ignition timing control system for internal combustion engine. B 480,473, Cl. 123-148.00E.
Sugahara, Syunji: *See—*
Mori, Yubi; Igaki, Yasuyuki; and Sugahara, Syunji, B 484,332.
Talke, Frank E.: *See—*
Nelson, George N.; Talke, Frank E.; and Tseng, Raymond C., B 458,964.
Taylor, John Anthony: *See—*
Ashton, Stanley; Laithwaite, Peter; and Taylor, John Anthony, B 546,149.
Thiel, Max: *See—*
Wiedemann, Fritz; Thiel, Max; Stach, Kurt; Dietmann, Karl; and Sponer, Gisbert, B 487,423.
Timken Company, The: *See—*
Cornish, Robert F., B 507,661.
Transelektro Magyar Villamossagi Kulkereskedelmi Vallalat: *See—*
Heller, Laszlo; Forgo, Laszlo; and Frank, Gyorgy, B 505,689.
Tseng, Raymond C.: *See—*
Nelson, George N.; Talke, Frank E.; and Tseng, Raymond C., B 458,964.
United States of America
Army: *See—*
Minnich, Violet C., B 510,521.
U.S. Philips Corporation: *See—*
Rouge, Serge; and Dumesnil, Richard, B 574,616.
United States Steel Corporation: *See—*
Bode, Charles H., Jr.; and Gallucci, Francis, B 396,916.
University of Michigan, The Regents of the: *See—*
Lucchesi, Benedict R., B 480,114.
Upjohn Company, The: *See—*
Lockwood, Robert J.; and Roess, Richard H., B 486,828.
Sekhar, Neel C., B 514,839.
Sekhar, Neel C., B 530,255.
Vater, Wulf: *See—*
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, B 445,166.
Vogel, Ludwig: *See—*
Hetzel, Eckhard; Vogel, Ludwig; Rotermund, Gerhard; and Horn, Hans Christoph, B 486,678.
von Strandtmann, Maximilian: *See—*
Connor, David T.; Ringel, Samuel M.; Roemer, Sidney; and von Strandtmann, Maximilian, B 482,058.
Walser, Armin: *See—*
Fryer, Rodney Ian; and Walser, Armin, B 419,582.
Ward, Charles Theodore; Mathis, Donald Lee; and Radcliff, Frank Taylor, to Combustion Engineering, Inc. Remote orientation of a probe in a tubular conduit. B 415,021, Cl. 73-432.00R.
Warner-Lambert Company: *See—*
Connor, David T.; Ringel, Samuel M.; Roemer, Sidney; and von Strandtmann, Maximilian, B 482,058.
Keegan, James J.; Patel, Girish; and Rubin, Howard, B 530,580.
Watson, Barry; and Breno, Philip J., to Owens-Illinois, Inc. Glass electrode for membrane diffusion analysis of gases. B 511,002, Cl. 204-195.00P.
Wehrli, Pius Anton, to Hoffmann-La Roche Inc. Synthesis of 2-methyl-3-buten-2-ol. B 480,662, Cl. 260-643.00R.
Westinghouse Electric Corporation: *See—*
Patel, Neville K., B 451,248.
Wilson, James C., B 509,165.
Wiechert, Rudolf; Steinbeck, Hermann; and Elger, Walter, to Schering Aktiengesellschaft. 15α,16α-Methylene-4-estren-17β-ols. B 484,068, Cl. 260-397.400.
Wiedemann, Fritz; Thiel, Max; Stach, Kurt; Dietmann, Karl; and Sponer, Gisbert, to Boehringer Mannheim G.m.b.H. N-substituted 1-amino-3-phenoxy-propan-2-ol compounds and therapeutic compositions containing them. B 487,423, Cl. 260-239.00D.
Wilson, James C., to Westinghouse Electric Corporation. Circuit interrupter including a current-limiting reactor. B 509,165, Cl. 335-7.000.
Wismer, Marco: *See—*
Bosso, Joseph F.; and Wismer, Marco, B 167,470.
Bosso, Joseph F.; and Wismer, Marco, B 455,686.
Wollensak, John C.: *See—*
Governale, Luke J.; and Wollensak, John C., B 449,837.

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		CAT.	PUB. DATE
Class 8			
10.2	B 430,334	C	Jan. 27, 1976
14	B 460,388	C	Jan. 27, 1976
	B 497,473	C	Feb. 3, 1976
17	B 458,060	C	Jan. 13, 1976
62	B 507,476	C	Feb. 10, 1976
74	B 354,959	C	Feb. 17, 1976
84	B 495,903	C	Feb. 17, 1976
115.7	B 389,304	C	Jan. 27, 1976
142	B 423,867	C	Feb. 3, 1976
161	B 461,352	C	Jan. 13, 1976
174	B 344,967	C	Feb. 3, 1976
Class 15			
147A	B 502,667	M	Feb. 24, 1976
229A	B 523,885	M	Feb. 17, 1976
256.53	B 579,116	M	Feb. 3, 1976
302	B 553,629	M	Feb. 24, 1976
Class 17			
23	B 519,599	M	Feb. 17, 1976
2502	B 541,496	E	Jan. 27, 1976
Class 21			
2.7R	B 527,999	C	Feb. 3, 1976
Class 23			
230B	B 554,039	C	Feb. 24, 1976
273SP	B 431,785	C	Feb. 24, 1976
285F	B 565,180	C	Jan. 27, 1976
Class 24			
75	B 532,476	M	Feb. 3, 1976
Class 28			
1.6	B 497,292	M	Feb. 3, 1976
Class 29			
96	B 546,911	M	Jan. 13, 1976
127	B 510,855	M	Jan. 27, 1976
180SS	B 421,975	C	Mar. 2, 1976
237	B 503,436	M	Feb. 24, 1976
428	B 520,928	M	Jan. 13, 1976
578	B 561,732	M	Feb. 3, 1976
580	B 492,301	M	Jan. 13, 1976
Class 32			
10A	B 491,501	M	Jan. 13, 1976
Class 35			
36	B 511,454	M	Feb. 24, 1976
Class 37			
8	B 558,819	M	Feb. 3, 1976
57	B 531,753	M	Mar. 2, 1976
142A	B 511,099	M	Feb. 3, 1976
Class 43			
129	B 442,866	M	Feb. 24, 1976
Class 44			
2	B 496,792	C	Feb. 17, 1976
Class 47			
57.6	B 548,028	M	Feb. 3, 1976
Class 48			
73	B 541,376	C	Feb. 17, 1976
358	B 576,859	M	Feb. 24, 1976
Class 51			
358	B 576,859	M	Feb. 24, 1976
Class 52			
207	B 459,597	M	Feb. 17, 1976
484	B 522,354	M	Jan. 20, 1976
Class 53			
77	B 508,878	M	Feb. 3, 1976
Class 55			
105	B 490,806	C	Feb. 3, 1976
352	B 543,941	C	Jan. 13, 1976
Class 56			
14.5	B 549,244	M	Jan. 27, 1976
15.9	B 558,973	M	Feb. 10, 1976
Class 58			
21.13	B 516,825	M	Feb. 3, 1976
Class 60			
226A	B 445,459	M	Feb. 3, 1976
299	B 551,133	M	Mar. 2, 1976
304	B 502,540	M	Jan. 13, 1976
349	B 541,464	M	Feb. 17, 1976
422	B 526,445	M	Jan. 20, 1976
424	B 584,520	M	Jan. 27, 1976
425	B 535,386	M	Jan. 13, 1976
431	B 551,809	M	Feb. 24, 1976
445	B 400,871	M	Feb. 17, 1976
592	B 465,145	M	Jan. 27, 1976
645	B 538,472	M	Feb. 3, 1976
690	B 505,689	M	Mar. 2, 1976
706	B 509,238	M	Feb. 24, 1976
Class 61			
.5	B 554,283	M	Jan. 27, 1976
Class 62			
306	B 522,009	M	Feb. 17, 1976
353	B 564,314	M	Jan. 20, 1976
Class 64			
27L	B 509,043	M	Feb. 24, 1976
Class 65			
3A	B 532,969	C	Jan. 13, 1976
49	B 517,858	C	Feb. 17, 1976
239	B 545,777	C	Jan. 27, 1976
Class 66			
116	B 438,882	M	Feb. 24, 1976
Class 71			
113	B 535,076	C	Jan. 20, 1976
Class 72			
43	B 546,631	M	Feb. 3, 1976
56	B 489,290	M	Feb. 17, 1976
88	B 575,757	M	Jan. 27, 1976
391	B 516,537	M	Feb. 17, 1976
Class 73			
24	B 506,744	M	Jan. 13, 1976
29	B 557,153	M	Feb. 3, 1976
37.7	B 532,319	M	Feb. 3, 1976
61.1R	B 511,909	M	Feb. 17, 1976
67.5H	B 522,309	M	Feb. 3, 1976
147	B 521,620	M	Jan. 27, 1976
190R	B 480,350	M	Feb. 10, 1976
302	B 464,290	M	Feb. 3, 1976
422GC	B 490,547	M	Feb. 24, 1976
432R	B 415,021	M	Mar. 2, 1976
437	B 528,401	M	Feb. 3, 1976
557	B 523,080	M	Feb. 17, 1976
Class 74			
18.2	B 501,975	M	Mar. 2, 1976
242.1A	B 567,854	M	Feb. 3, 1976
243C	B 558,818	M	Jan. 13, 1976
479	B 509,586	M	Feb. 3, 1976
481	B 497,021	M	Jan. 13, 1976
482	B 525,809	M	Feb. 24, 1976
527	B 470,170	M	Jan. 13, 1976
546	B 518,999	M	Feb. 3, 1976
765	B 500,945	M	Feb. 24, 1976
Class 75			
.5BA	B 385,631	C	Jan. 27, 1976
84.1R	B 538,491	C	Feb. 17, 1976

NOTE.—First number, class; second number, subclass; third number, document number

		CAT.	PUB. DATE
101BE	B 452,938	C	Feb. 17, 1976
135	B 525,961	C	Jan. 13, 1976
156.5	B 411,471	C	Feb. 17, 1976
165	B 483,256	C	Feb. 10, 1976
Class 83			
61	B 570,862	M	Feb. 24, 1976
425	B 545,935	M	Jan. 27, 1976
Class 84			
1.16	B 556,897	M	Feb. 3, 1976
275	B 504,169	M	Jan. 13, 1976
Class 86			
1R	B 356,187	M	Jan. 20, 1976
Class 96			
1R	B 423,883	C	Jan. 27, 1976
1.4	B 200,759	C	Feb. 3, 1976
33	B 437,894	C	Mar. 2, 1976
35	B 524,026	C	Feb. 10, 1976
35.1	B 462,893	C	Feb. 24, 1976
	B 530,873	C	Feb. 17, 1976
36.1	B 359,901	C	Jan. 13, 1976
45	B 455,759	C	Feb. 24, 1976
54	B 367,305	C	Mar. 2, 1976
78	B 503,029	C	Jan. 27, 1976
Class 99			
335	B 557,299	M	Feb. 3, 1976
162B	B 432,991	M	Mar. 2, 1976
Class 101			
93.13	B 496,999	M	Jan. 27, 1976
93.14	B 481,600	M	Jan. 27, 1976
129	B 416,589	M	Jan. 27, 1976
401.3	B 494,234	M	Feb. 10, 1976
Class 102			
32	B 405,726	M	Jan. 13, 1976
42R	B 443,163	M	Feb. 3, 1976
69	B 412,068	M	Jan. 13, 1976
Class 106			
27	B 452,883	C	Jan. 27, 1976
57	B 502,773	C	Jan. 13, 1976
309	B 311,779	C	Feb. 10, 1976
Class 109			
1SB	B 358,427	E	Feb. 3, 1976
Class 110			
8R	B 512,324	M	Feb. 17, 1976
Class 114			
144R	B 529,659	M	Feb. 24, 1976
Class 116			
124L	B 469,228	M	Feb. 17, 1976
124.4	B 467,412	M	Jan. 13, 1976
Class 118			
637	B 563,301	M	Feb. 17, 1976
Class 123			
8.45	B 570,172	M	Feb. 3, 1976
25R	B 447,440	M	Feb. 17, 1976
75B	B 563,780	M	Feb. 3, 1976
122AC	B 498,951	M	Mar. 2, 1976
148E	B 480,473	M	Mar. 2, 1976
182	B 558,251	M	Jan. 13, 1976
325T	B 425,588	M	Jan. 13, 1976
Class 126			
271	B 512,745	M	Jan. 13, 1976
350A	B 537,903	M	Jan. 20, 1976
Class 128			
2.6R	B 534,574	M	Feb. 24, 1976
260	B 520,277	M	Feb. 17, 1976
	B 524,121	M	Feb. 3, 1976
419P	B 535,466	M	Jan. 27, 1976
419PG	B 533,259	M	Feb. 24, 1976
Class 131			
144	B 586,387	M	Feb. 3, 1976
514.4	B 586,380	M	Mar. 2, 1976
Class 136			
26	B 511,665	C	Mar. 2, 1976
86R	B 505,126	C	Feb. 10, 1976
	B 574,128	C	Feb. 17, 1976
89	B 510,677	C	Feb. 24, 1976
148	B 524,464	C	Feb. 10, 1976
202	B 378,513	C	Jan. 27, 1976
Class 137			
255	B 508,940	M	Feb. 17, 1976
596.12	B 514,687	M	Jan. 27, 1976
608	B 490,623	M	Mar. 2, 1976
614.11	B 530,605	M	Feb. 3, 1976
625.46	B 528,756	M	Feb. 3, 1976
798	B 430,172	M	Jan. 13, 1976
Class 140			
92.1	B 590,158	M	Feb. 10, 1976
	B 590,159	M	Feb. 3, 1976
Class 144			
32R	B 484,332	M	Mar. 2, 1976
34R	B 521,793	M	Feb. 24, 1976
241	B 545,630	M	Jan. 27, 1976
Class 148			
1.5	B 518,226	C	Feb. 10, 1976
Class 152			
213R	B 445,690	M	Feb. 3, 1976
Class 156			
3	B 563,722	C	Jan. 13, 1976
66	B 497,584	C	Feb. 24, 1976
71	B 456,148	C	Jan. 13, 1976
73.6	B 414,481	C	Jan. 20, 1976
143	B 462,386	C	Jan. 13, 1976
159	B 339,446	C	Feb. 24, 1976
Class 160			
229R	B 505,813	M	Jan. 13, 1976
Class 162			
5	B 491,673	C	Feb. 17, 1976
133	B 431,072	C	Jan. 20, 1976
198	B 150,142	C	Jan. 27, 1976
290	B 478,739	C	Feb. 17, 1976
Class 164			
26	B 499,227	M	Jan. 27, 1976
60	B 511,885	M	Jan. 27, 1976
282	B 396,916	M	Mar. 2, 1976
330	B 522,038	M	Feb. 3, 1976
Class 165			
13	B 543,078	M	Feb. 17, 1976
Class 166			
224	B 492,120	M	Feb. 24, 1976
272	B 569,519	M	Feb. 3, 1976
303	B 529,836	M	Feb. 3, 1976
311	B 511,156	M	Jan. 27, 1976
Class 173			
104	B 537,709	M	Jan. 13, 1976
170	B 567,058	M	Jan. 13, 1976
Class 174			
52R	B 492,902	E	Feb. 24, 1976
Class 176			
20R	B 384,330	C	Jan. 27, 1976
36R	B 367,621	C	Feb. 3, 1976
68	B 396,164	C	Feb. 3, 1976
Class 178			
6	B 546,426	E	Jan. 27, 1976
7.1	B 519,979	E	Feb. 3, 1976
7.3D	B 442,970	E	Feb. 3, 1976
7.5R	B 508,817	E	Feb. 3, 1976
58R	B 399,908	C	Jan. 13, 1976
66R	B 498,775	E	Mar. 2, 1976
88	B 561,764	E	Jan. 27, 1976
Class 179			
1A	B 513,756	E	Feb. 3, 1976
1CN	B 475,681	E	Jan. 20, 1976
1SM	B 476,577	E	Jan. 20, 1976
1G	B 554,594	E	Jan. 20, 1976
7.1R	B 545,050	E	Jan. 20, 1976
15AL	B 496,500	E	Feb. 3, 1976
81R	B 472,284	E	Jan. 13, 1976
170D	B 541,415	E	Feb. 3, 1976
Class 180			
5R	B 499,171	M	Jan. 27, 1976
44F	B 432,969	M	Mar. 2, 1976
49	B 433,094	M	Jan. 27, 1976
53R	B 551,527	M	Jan. 13, 1976
79.2R	B 533,968	M	Jan. 27, 1976

NOTE.—First number, class; second number, subclass; third number, document number

		CAT.	PUB. DATE
103	B 490,647	M	Feb. 24, 1976
Class 187			
.1R	B 436,724	M	Feb. 24, 1976
Class 188			
71.1	B 535,411	M	Feb. 24, 1976
73.6	B 533,056	M	Jan. 13, 1976
165	B 567,435	M	Feb. 3, 1976
218XL	B 562,698	M	Jan. 13, 1976
Class 192			
3.57	B 548,719	M	Feb. 17, 1976
4A	B 531,267	M	Feb. 24, 1976
Class 195			
1.8	B 530,255	E	Mar. 2, 1976
	B 514,839	C	Mar. 2, 1976
29	B 418,489	C	Jan. 13, 1976
65	B 566,585	C	Mar. 2, 1976
	B 592,146	C	Mar. 2, 1976
68	B 395,975	C	Mar. 2, 1976
Class 196			
14.52	B 520,384	M	Jan. 27, 1976
Class 197			
17	B 501,122	M	Feb. 17, 1976
18	B 535,391	M	Jan. 27, 1976
Class 198			
38	B 495,402	M	Feb. 17, 1976
129	B 569,646	M	Jan. 13, 1976
179	B 424,989	M	Feb. 3, 1976
202	B 499,352	M	Jan. 27, 1976
Class 200			
5R	B 579,104	E	Jan. 27, 1976
11TC	B 531,425	E	Feb. 3, 1976
16C	B 480,740	E	Mar. 2, 1976
38FA	B 494,383	E	Feb. 3, 1976
61.41	B 506,286	E	Jan. 20, 1976
67D	B 585,247	E	Feb. 3, 1976
83SA	B 428,877	E	Jan. 27, 1976
84C	B 453,533	E	Feb. 17, 1976
309	B 470,899	E	Mar. 2, 1976
339	B 466,390	E	Feb. 24, 1976
Class 202			
227	B 513,280	C	Jan. 20, 1976
Class 204			
9	B 462,424	C	Feb. 24, 1976
15	B 542,135	C	Feb. 10, 1976
158HA	B 550,744	C	Feb. 17, 1976
159.18	B 498,205	C	Feb. 10, 1976
159.22	B 423,404	C	Mar. 2, 1976
163R	B 526,447	C	Feb. 24, 1976
181	B 167,470	C	Mar. 2, 1976
195P	B 511,002	C	Mar. 2, 1976
195S	B 843,038	C	Feb. 3, 1976
224M	B 534,314	C	Feb. 10, 1976
Class 206			
451	B 371,912	M	Mar. 2, 1976
455	B 490,067	M	Jan. 27, 1976
Class 208			
15	B 437,596	C	Jan. 27, 1976
59	B 508,118	C	Feb. 17, 1976
78	B 467,250	C	Feb. 3, 1976
208R	B 508,119	C	Feb. 17, 1976
210	B 501,317	C	Jan. 13, 1976
253	B 438,916	C	Jan. 13, 1976
Class 210			
23H	B 364,797	C	Feb. 17, 1976
	B 524,806	C	Mar. 2, 1976
130	B 532,901	C	Jan. 13, 1976
189	B 492,716	C	Mar. 2, 1976
Class 214			
1C	B 453,238	M	Mar. 2, 1976
18N	B 373,344	M	Feb. 3, 1976
58	B 555,772	M	Jan. 13, 1976
152	B 480,604	M	Jan. 13, 1976
Class 215			
216	B 541,015	M	Jan. 27, 1976
Class 219			
69M	B 426,227	E	Mar. 2, 1976
201	B 451,248	E	Mar. 2, 1976
233	B 463,388	E	Feb. 10, 1976
273	B 403,507	E	Feb. 10, 1976
553	B 513,027	E	Feb. 17, 1976
Class 220			
23.83	B 529,156	M	Jan. 13, 1976
288	B 516,032	M	Jan. 27, 1976
337	B 578,447	M	Jan. 20, 1976
Class 222			
43	B 497,853	M	Feb. 17, 1976
67	B 521,480	M	Jan. 13, 1976
136	B 487,260	M	Jan. 27, 1976
306	B 559,954	M	Feb. 3, 1976
325	B 515,303	M	Jan. 20, 1976
Class 226			
21	B 504,778	M	Feb. 24, 1976
68	B 506,926	M	Feb. 17, 1976
Class 228			
190	B 473,972	M	Jan. 13, 1976
Class 229			
2.5	B 537,990	M	Jan. 13, 1976
17R	B 461,257	M	Jan. 13, 1976
62.5	B 429,157	M	Jan. 27, 1976
Class 235			
151.1	B 520,063	E	Mar. 2, 1976
	B 520,075	E	Feb. 24, 1976
	B 520,076	E	Mar. 2, 1976
151.34	B 492,946	E	Jan. 27, 1976
152	B 559,737	E	Jan. 20, 1976
154	B 534,016	E	Feb. 3, 1976
156	B 536,009	E	Jan. 27, 1976
181	B 520,924	E	Jan. 27, 1976
Class 236			
13	B 502,652	M	Feb. 24, 1976
15A	B 558,813	M	Feb. 3, 1976
Class 239			
424	B 580,921	M	Jan. 13, 1976
424	B 586,215	M	Jan. 20, 1976
652	B 520,534	M	Feb. 17, 1976
Class 240			
41.35R	B 454,283	E	Feb. 3, 1976
Class 242			
43R	B 521,600	M	Jan. 27, 1976
107.4A	B 487,427	M	Mar. 2, 1976
129.8	B 506,167	M	Feb. 10, 1976
Class 244			
3.27	B 510,521	M	Mar. 2, 1976
134R	B 535,928	M	Jan. 13, 1976
169	B 423,441	M	Feb. 17, 1976
	B 511,346	M	Jan. 27, 1976
Class 248			
49	B 398,488	M	Feb. 24, 1976
73	B 494,806	M	Feb. 3, 1976
Class 249			
135	B 548,155	M	Jan. 13, 1976
Class 250			
210	B 515,908	E	Jan. 20, 1976
227	B 522,577	E	Jan. 27, 1976
	B 560,765	E	Feb. 3, 1976
291	B 500,981	E	Jan. 27, 1976
364	B 526,190	E	Feb. 17, 1976
402	B 451,534	E	Jan. 13, 1976
445T	B 574,616	E	Mar. 2, 1976
577	B 507,396	E	Feb. 10, 1976
Class 251			
1B	B 541,710	M	Feb. 24, 1976
58	B 429,434	M	Feb. 17, 1976
129	B 534,333	M	Feb. 17, 1976
319	B 490,589	M	Feb. 3, 1976
Class 252			
12	B 559,142	C	Mar. 2, 1976
156	B 520,546	C	Mar. 2, 1976
182	B 471,405	C	Feb. 10, 1976
301.1W	B 548,058	C	Feb. 17, 1976
301.4S	B 535,813	C	Jan. 27, 1976
364	B 370,309	C	Jan. 20, 1976
404	B 569,125	C	Feb. 24, 1976
408R	B 544,476	C	Feb. 24, 1976

NOTE.—First number, class; second number, subclass; third number, document number

		CAT.	PUB. DATE
429R	B 457,850	C	Feb. 10, 1976
432	B 509,640	C	Feb. 17, 1976
454	B 450,967	C	Jan. 13, 1976
500	B 479,242	C	Feb. 17, 1976
518	B 585,731	C	Feb. 3, 1976
543	B 403,766	C	Feb. 10, 1976
Class 254			
186R	B 511,407	M	Feb. 10, 1976
188	B 437,559	M	Feb. 3, 1976
190R	B 489,685	M	Feb. 24, 1976
Class 259			
4	B 486,614	N	Feb. 17, 1976
191	B 556,057	M	Jan. 13, 1976
Class 260			
2.5AC	B 497,194	C	Feb. 3, 1976
	B 537,102	C	Jan. 13, 1976
2.5AJ	B 557,856	C	Feb. 10, 1976
2.5AM	B 422,063	C	Feb. 3, 1976
2.5AR	B 483,606	C	Jan. 27, 1976
	B 502,589	C	Jan. 27, 1976
2.5AV	B 460,441	C	Jan. 13, 1976
2.5AW	B 483,762	C	Feb. 10, 1976
	B 486,828	C	Mar. 2, 1976
2.5R	B 471,579	C	Jan. 13, 1976
17R	B 510,998	C	Feb. 10, 1976
	B 519,487	C	Feb. 17, 1976
17.4ST	B 530,580	C	Mar. 2, 1976
18TN	B 528,303	C	Feb. 10, 1976
23H	B 54,859	C	Feb. 17, 1976
23XA	B 483,865	C	Jan. 13, 1976
28P	B 489,331	C	Feb. 17, 1976
28.5AS	B 501,540	C	Jan. 13, 1976
29.2EP	B 455,686	C	Mar. 2, 1976
	B 526,997	C	Jan. 13, 1976
29.2TN	B 414,266	C	Feb. 10, 1976
29.6N	B 494,440	C	Feb. 17, 1976
29.6TA	B 494,450	C	Feb. 17, 1976
30.4R	B 485,060	C	Feb. 17, 1976
32.6R	B 596,692	C	Feb. 17, 1976
33.6AQ	B 657,438	C	Jan. 20, 1976
33.6R	B 479,175	C	Feb. 17, 1976
33.8UA	B 497,780	C	Feb. 24, 1976
37EP	B 423,365	C	Feb. 17, 1976
	B 441,605	C	Feb. 3, 1976
37R	B 465,955	C	Feb. 3, 1976
42.15	B 415,122	C	Feb. 10, 1976
42.18	B 519,095	C	Feb. 24, 1976
45.75W	B 561,387	C	Feb. 10, 1976
45.8N	B 506,648	C	Feb. 3, 1976
45.85R	B 236,342	C	Feb. 10, 1976
46.5UA	B 528,962	C	Feb. 24, 1976
	B 528,966	C	Feb. 24, 1976
47EP	B 440,633	C	Feb. 10, 1976
63UY	B 470,576	C	Feb. 24, 1976
75N	B 521,125	C	Feb. 10, 1976
	B 521,126	C	Feb. 10, 1976
	B 521,127	C	Feb. 17, 1976
	B 521,128	C	Feb. 10, 1976
	B 552,489	C	Feb. 10, 1976
77.5AN	B 474,645	C	Mar. 2, 1976
77.5CR	B 306,668	C	Feb. 3, 1976
78.5R	B 437,209	C	Feb. 3, 1976
78S	B 451,308	C	Feb. 17, 1976
79.5P	B 546,149	C	Mar. 2, 1976
82.1	B 443,563	C	Feb. 24, 1976
88.2C	B 417,014	C	Jan. 13, 1976
93.5A	B 530,174	C	Feb. 24, 1976
112.5R	B 471,617	C	Feb. 10, 1976
	B 503,817	C	Jan. 13, 1976
140R	B 503,579	C	Feb. 10, 1976
143	B 419,582	C	Mar. 2, 1976
147	B 383,697	C	Feb. 17, 1976
239A	B 349,370	C	Jan. 27, 1976
239D	B 520,256	C	Jan. 13, 1976
	B 536,935	C	Jan. 13, 1976
239B	B 470,900	C	Mar. 2, 1976
239D	B 487,423	C	Mar. 2, 1976
239.1	B 538,753	C	Feb. 10, 1976
	B 547,208	C	Feb. 24, 1976
239.3A	B 506,148	C	Feb. 3, 1976
240A	B 484,067	C	Feb. 17, 1976
240G	B 482,709	C	Feb. 24, 1976
243C	B 442,810	C	Feb. 24, 1976
	B 473,039	C	Feb. 10, 1976
	B 473,040	C	Feb. 10, 1976
	B 516,047	C	Feb. 10, 1976
	B 516,296	C	Feb. 3, 1976
	B 526,096	C	Feb. 3, 1976
244R	B 348,433	C	Feb. 3, 1976
247.7T	B 468,052	C	Feb. 10, 1976
248NS	B 537,711	C	Jan. 13, 1976
250BC	B 491,883	C	Feb. 3, 1976
251A	B 480,625	C	Feb. 24, 1976
256.4Q	B 503,345	C	Feb. 24, 1976
256.5R	B 531,096	C	Feb. 10, 1976
268BF	B 490,946	C	Feb. 17, 1976
274SA	B 494,944	C	Feb. 17, 1976
285.5	B 530,318	C	Jan. 13, 1976
287C	B 492,039	C	Feb. 24, 1976
288R	B 402,162	C	Mar. 2, 1976
290R	B 445,493	C	Mar. 2, 1976
293.54	B 545,464	C	Feb. 10, 1976
293.56	B 447,000	C	Feb. 3, 1976
293.57	B 426,802	C	Feb. 17, 1976
294.8D	B 526,510	C	Jan. 20, 1976
294.8G	B 445,166	C	Mar. 2, 1976
295.5A	B 515,642	C	Feb. 24, 1976
	B 545,299	C	Feb. 24, 1976
295.5B	B 458,617	C	Feb. 3, 1976
296R	B 477,252	C	Jan. 13, 1976
306.7C	B 385,024	C	Feb. 10, 1976
307D	B 486,280	C	Feb. 3, 1976
307H	B 471,836	C	Feb. 24, 1976
	B 554,848	C	Feb. 24, 1976
308A	B 488,111	C	Jan. 13, 1976
308D	B 532,005	C	Feb. 24, 1976
309.2	B 522,567	C	Feb. 17, 1976
	B 542,158	C	Jan. 13, 1976
310R	B 535,437	C	Feb. 24, 1976
314.5	B 426,266	C	Mar. 2, 1976
326R	B 486,678	C	Mar. 2, 1976
	B 398,084	C	Feb. 3, 1976
326.5B	B 276,026	C	Feb. 3, 1976
326.5FN	B 484,269	C	Feb. 10, 1976
326.9	B 477,481	C	Feb. 3, 1976
327C	B 480,452	C	Feb. 10, 1976
330.5	B 552,498	C	Jan. 13, 1976
	B 574,996	C	Feb. 17, 1976
340.5	B 504,877	C	Feb. 24, 1976
340.9	B 476,372	C	Feb. 24, 1976
	B 521,643	C	Mar. 2, 1976
343.2R	B 491,032	C	Feb. 10, 1976
343.3	B 536,675	C	Jan. 20, 1976
343.3R	B 495,550	C	Feb. 3, 1976
	B 495,554	C	Feb. 3, 1976
346.2M	B 440,858	C	Feb. 3, 1976
	B 302,160	C	Feb. 3, 1976
346.4	B 485,051	C	Feb. 17, 1976
348.5L	B 521,324	C	Jan. 27, 1976
348.6	B 546,295	C	Jan. 20, 1976
378	B 431,713	C	Feb. 10, 1976
397.4	B 484,068	C	Mar. 2, 1976
429.7	B 464,587	C	Feb. 3, 1976
429.9	B 455,481	C	Feb. 24, 1976
438.1	B 518,656	C	Feb. 17, 1976
448.2H	B 390,408	C	Feb. 3, 1976
448.2N	B 551,463	C	Feb. 17, 1976
465.5R	B 747,785	C	Feb. 10, 1976
465.7	B 564,252	C	Mar. 2, 1976
465.9	B 456,900	C	Feb. 3, 1976
	B 530,925	C	Feb. 24, 1976
471R	B 385,483	C	Feb. 17, 1976
	B 388,521	C	Jan. 13, 1976
472	B 472,256	C	Jan. 13, 1976
	B 491,052	C	Mar. 2, 1976
473S	B 532,140	C	Mar. 2, 1976
483	B 410,074	C	Feb. 24, 1976
493	B 351,455	C	Feb. 24, 1976
501.12	B 544,899	C	Feb. 17, 1976
513R	B 494,669	C	Feb. 3, 1976
515A	B 390,031	C	Jan. 13, 1976
516	B 386,828	C	Feb. 3, 1976
534R	B 301,143	C	Jan. 27, 1976
544C	B 471,116	C	Feb. 17, 1976
553R	B 391,473	C	Mar. 2, 1976
554	B 529,974	C	Feb. 17, 1976
557R	B 386,257	C	Feb. 3, 1976
561R	B 513,781	C	Feb. 24, 1976
566A	B 513,014	C	Feb. 10, 1976
567.6M	B 480,114	C	Mar. 2, 1976
568	B 529,974	C	Feb. 17, 1976
578	B 449,837	C	Mar. 2, 1976
580	B 503,742	C	Feb. 17, 1976
586C	B 438,484	C	Feb. 17, 1976
593R	B 468,350	C	Jan. 13, 1976
598	B 465,202	C	Feb. 24, 1976
601R	B 208,916	C	Jan. 13, 1976
604HF	B 472,241	C	Feb. 17, 1976
609E	B 474,573	C	Jan. 20, 1976
621H	B 501,128	C	Feb. 24, 1976

NOTE.—First number, class; second number, subclass; third number, document number

		CAT.	PUB. DATE
621K	B 470,348	C	Jan. 13, 1976
632R	B 553,584	C	Feb. 17, 1976
637R	B 519,446	C	Feb. 24, 1976
643R	B 480,662	C	Mar. 2, 1976
647	B 394,248	C	Jan. 27, 1976
648F	B 330,736	C	Feb. 3, 1976
665R	B 460,846	C	Feb. 24, 1976
668D	B 430,157	C	Feb. 17, 1976
674SA	B 426,274	C	Jan. 20, 1976
683.15D	B 428,103	C	Feb. 10, 1976
683.48	B 526,027	C	Feb. 17, 1976
859R	B 519,485	C	Feb. 10, 1976
873	B 465,688	C	Jan. 27, 1976
	B 519,486	C	Feb. 17, 1976
876B	B 575,851	C	Feb. 10, 1976
876R	B 589,966	C	Feb. 17, 1976
	B 461,184	C	Feb. 17, 1976
	B 580,826	C	Feb. 17, 1976
	B 589,966	C	Feb. 17, 1976
880B	B 510,458	C	Feb. 10, 1976
884	B 456,579	C	Feb. 10, 1976
890	B 495,408	C	Feb. 3, 1976
927N	B 369,221	C	Feb. 24, 1976
929	B 502,993	C	Feb. 17, 1976
937	B 512,373	C	Feb. 10, 1976
940	B 496,430	C	Feb. 10, 1976
942	B 386,673	C	Feb. 3, 1976
948	B 534,591	C	Feb. 17, 1976
Class 261			
39A	B 562,462	C	Jan. 13, 1976
98	B 480,702	C	Jan. 27, 1976
Class 264			
36	B 308,659	C	Jan. 27, 1976
49	B 417,164	C	Mar. 2, 1976
51	B 506,144	C	Feb. 10, 1976
	B 508,369	C	Jan. 13, 1976
161	B 555,437	C	Feb. 3, 1976
225	B 453,759	C	Jan. 27, 1976
Class 270			
62	B 516,609	M	Feb. 24, 1976
Class 274			
37	B 526,388	M	Feb. 3, 1976
Class 277			
27	B 544,034	M	Feb. 17, 1976
81P	B 515,216	M	Feb. 17, 1976
184	B 426,819	M	Feb. 17, 1976
Class 280			
150.5	B 583,051	M	Feb. 3, 1976
236	B 572,642	M	Feb. 10, 1976
Class 290			
17	B 477,597	E	Feb. 17, 1976
Class 292			
254	B 549,964	M	Feb. 24, 1976
Class 293			
71P	B 552,932	M	Feb. 3, 1976
Class 296			
35R	B 443,647	M	Feb. 17, 1976
	B 463,671	M	Jan. 13, 1976
Class 298			
35M	B 510,588	M	Jan. 27, 1976
Class 299			
31	B 499,209	M	Feb. 24, 1976
Class 305			
27	B 506,566	M	Jan. 20, 1976
Class 307			
88.3	B 540,872	E	Jan. 20, 1976
137	B 466,444	E	Jan. 20, 1976
205	B 513,368	E	Feb. 3, 1976
232	B 540,078	E	Jan. 13, 1976
251	B 548,302	E	Feb. 17, 1976
255	B 492,688	E	Jan. 20, 1976
270	B 497,960	E	Jan. 20, 1976
293	B 519,932	E	Feb. 3, 1976
296	B 512,849	E	Feb. 3, 1976
Class 308			
207R	B 507,661	M	Mar. 2, 1976
Class 310			
4R	B 539,746	E	Feb. 17, 1976
9.6	B 501,482	E	Jan. 13, 1976
41	B 561,784	E	Jan. 27, 1976
90	B 458,500	E	Feb. 24, 1976
155	B 592,143	C	Jan. 27, 1976
168	B 526,289	E	Feb. 24, 1976
254	B 521,045	E	Feb. 24, 1976
	B 521,046	E	Feb. 24, 1976
259	B 521,044	E	Feb. 24, 1976
Class 313			
42	B 534,443	E	Jan. 27, 1976
60	B 513,706	M	Jan. 13, 1976
99	B 518,859	E	Feb. 3, 1976
273	B 531,929	E	Jan. 20, 1976
330	B 504,056	C	Feb. 24, 1976
366	B 515,455	E	Jan. 27, 1976
404	B 523,696	E	Jan. 13, 1976
452	B 160,045	E	Jan. 13, 1976
477	B 279,969	E	Jan. 13, 1976
Class 315			
169TV	B 463,322	E	Jan. 20, 1976
241P	B 501,503	E	Mar. 2, 1976
371	B 483,615	E	Jan. 27, 1976
388	B 516,002	E	Jan. 13, 1976
399	B 467,971	E	Jan. 13, 1976
408	B 516,564	E	Feb. 17, 1976
Class 317			
9R	B 488,634	E	Jan. 20, 1976
36TD	B 504,404	E	Feb. 24, 1976
101A	B 420,472	E	Feb. 24, 1976
120	B 527,187	E	Feb. 17, 1976
124	B 509,606	E	Feb. 3, 1976
259	B 506,461	E	Jan. 20, 1976
Class 318			
139	B 475,236	E	Feb. 3, 1976
231	B 511,886	E	Feb. 3, 1976
257	B 502,973	E	Jan. 27, 1976
Class 321			
2	B 533,734	E	Jan. 27, 1976
7	B 509,185	E	Feb. 3, 1976
61	B 495,759	E	Feb. 3, 1976
Class 323			
1	B 430,276	E	Jan. 20, 1976
17	B 459,811	E	Jan. 20, 1976
	B 583,089	E	Jan. 27, 1976
22T	B 501,181	E	Feb. 10, 1976
Class 324			
13	B 79,099	E	Jan. 13, 1976
51	B 534,767	E	Feb. 3, 1976
60C	B 540,218	E	Feb. 10, 1976
62	B 465,393	E	Jan. 27, 1976
Class 325			
40	B 558,220	E	Jan. 27, 1976
468	B 544,961	E	Jan. 13, 1976
Class 328			
129	B 78,315	E	Feb. 10, 1976
155	B 550,693	E	Jan. 20, 1976
Class 330			
15	B 530,813	E	Feb. 17, 1976
33	B 439,542	E	Jan. 27, 1976
207P	B 553,460	E	Feb. 3, 1976
Class 331			
44ST	B 527,669	E	Jan. 13, 1976
51	B 538,686	E	Jan. 13, 1976
94.5C	B 549,931	E	Jan. 20, 1976
94.5L	B 506,916	E	Feb. 3, 1976
94.5M	B 384,654	E	Feb. 24, 1976
94.5P	B 394,350	E	Jan. 13, 1976
116R	B 527,693	E	Feb. 3, 1976
117R	B 571,219	E	Feb. 24, 1976
Class 332			
9R	B 507,087	E	Feb. 17, 1976
Class 333			
30R	B 453,616	E	Jan. 27, 1976
31A	B 568,770	E	Feb. 10, 1976
72	B 534,991	E	Jan. 27, 1976
73W	B 339,194	E	Feb. 3, 1976

NOTE.—First number, class; second number, subclass; third number, document number

		CAT.	PUB. DATE
Class 335			
7	B 509,165	E	Mar. 2, 1976
210	B 541,517	E	Jan. 13, 1976
253	B 515,452	E	Feb. 10, 1976
Class 338			
165	B 489,526	E	Feb. 3, 1976
202	B 528,761	E	Feb. 10, 1976
Class 340			
8L	B 270,274	E	Feb. 17, 1976
146.1AB	B 428,408	E	Mar. 2, 1976
167B	B 568,226	E	Feb. 24, 1976
172.5	B 461,336	E	Feb. 3, 1976
	B 482,907	E	Jan. 20, 1976
	B 485,575	E	Feb. 24, 1976
	B 533,454	E	Mar. 2, 1976
173R	B 545,945	M	Jan. 27, 1976
174DC	B 443,712	E	Jan. 27, 1976
174TF	B 429,018	C	Feb. 10, 1976
	B 455,425	E	Feb. 3, 1976
	B 476,681	E	Jan. 13, 1976
	B 499,718	E	Jan. 27, 1976
198	B 546,665	E	Jan. 20, 1976
347AD	B 507,647	E	Jan. 27, 1976
	B 526,106	E	Jan. 27, 1976
347CC	B 498,500	E	Jan. 20, 1976
Class 343			
7A	B 248,240	E	Jan. 13, 1976
7.7	B 484,029	E	Feb. 10, 1976
8	B 497,702	E	Mar. 2, 1976
100LE	B 488,395	E	Jan. 27, 1976
100LE	B 496,502	E	Jan. 20, 1976
786	B 547,994	E	Jan. 20, 1976
815	B 563,244	E	Jan. 27, 1976
Class 346			
75	B 512,964	E	Feb. 10, 1976
Class 350			
96WG	B 381,985	M	Feb. 3, 1976
	B 537,722	M	Feb. 3, 1976
103	B 586,663	M	Feb. 3, 1976
160LC	B 527,054	M	Feb. 17, 1976
173	B 469,947	M	Jan. 20, 1976
310	B 520,543	M	Jan. 27, 1976
320	B 548,440	M	Feb. 3, 1976
Class 354			
46	B 515,135	E	Feb. 17, 1976
70	B 533,580	E	Feb. 3, 1976
156	B 507,131	E	Mar. 2, 1976
174	B 502,161	E	Mar. 2, 1976
288	B 559,111	E	Feb. 24, 1976
298	B 489,328	E	Jan. 20, 1976
Class 355			
8	B 509,474	M	Feb. 17, 1976
17	B 493,501	M	Feb. 3, 1976
Class 356			
201	B 450,521	M	Feb. 17, 1976
Class 357			
16	B 496,487	E	Jan. 20, 1976
23	B 516,060	E	Feb. 17, 1976
36	B 508,961	E	Feb. 3, 1976
65	B 470,798	E	Jan. 20, 1976
72	B 481,930	E	Feb. 24, 1976
Class 358			
8	B 554,939	E	Feb. 10, 1976
41	B 502,289	E	Jan. 13, 1976
Class 360			
1	B 484,365	E	Jan. 27, 1976
15	B 283,941	E	Feb. 3, 1976
17	B 461,874	E	Jan. 27, 1976
27	B 427,883	E	Jan. 20, 1976
60	B 491,111	E	Feb. 17, 1976
78	B 487,411	E	Feb. 24, 1976
80	B 403,477	E	Feb. 3, 1976
81	B 500,176	E	Feb. 3, 1976
85	B 501,253	E	Feb. 3, 1976
102	B 458,964	E	Mar. 2, 1976
130	B 579,806	E	Feb. 3, 1976
Class 401			
219	B 557,621	M	Feb. 3, 1976
Class 403			
107	B 513,789	M	Feb. 3, 1976
318	B 540,632	M	Jan. 13, 1976
Class 404			
71	B 452,672	M	Jan. 13, 1976
77	B 434,206	M	Feb. 3, 1976
Class 408			
124	B 501,993	M	Jan. 13, 1976
146	B 521,986	M	Feb. 3, 1976
Class 415			
14	B 471,735	M	Feb. 3, 1976
115	B 561,712	C	Feb. 17, 1976
136	B 563,412	M	Feb. 24, 1976
213R	B 512,547	M	Jan. 13, 1976
214	B 552,006	M	Feb. 3, 1976
Class 416			
61	B 549,394	M	Jan. 27, 1976
Class 423			
238	B 485,401	C	Jan. 27, 1976
242	B 66,272	C	Feb. 24, 1976
249	B 402,553	C	Feb. 17, 1976
283	B 521,984	C	Feb. 17, 1976
315	B 471,221	C	Jan. 13, 1976
390	B 549,198	C	Jan. 13, 1976
393	B 491,455	C	Feb. 3, 1976
448	B 414,028	C	Feb. 17, 1976
580	B 379,177	C	Jan. 27, 1976
Class 424			
9	B 426,424	C	Feb. 3, 1976
115	B 482,660	C	Feb. 10, 1976
118	B 542,226	C	Feb. 24, 1976
122	B 482,058	C	Mar. 2, 1976
	B 524,179	C	Jan. 13, 1976
177	B 490,995	C	Feb. 3, 1976
203	B 576,903	C	Feb. 3, 1976
230	B 487,133	C	Jan. 27, 1976
246	B 399,098	C	Feb. 24, 1976
257	B 374,588	C	Jan. 27, 1976
258	B 426,639	C	Feb. 3, 1976
263	B 466,929	C	Jan. 27, 1976
267	B 307,698	C	Feb. 3, 1976
	B 407,737	C	Feb. 3, 1976
270	B 521,711	C	Feb. 10, 1976
273	B 566,464	C	Feb. 3, 1976
274	B 496,431	C	Jan. 13, 1976
	B 547,547	C	Feb. 24, 1976
281	B 587,786	C	Feb. 17, 1976
311	B 457,862	C	Jan. 27, 1976
317	B 510,850	C	Feb. 3, 1976
362	B 495,489	C	Feb. 3, 1976
Class 425			
222	B 163,463	M	Jan. 27, 1976
384	B 562,813	C	Feb. 3, 1976
521	B 411,765	M	Feb. 24, 1976
Class 426			
3	B 583,712	C	Feb. 10, 1976
73	B 493,950	C	Mar. 2, 1976
239	B 572,726	C	Feb. 24, 1976
276	B 535,944	C	Jan. 13, 1976
535	B 560,717	C	Feb. 10, 1976
548	B 439,778	C	Feb. 3, 1976
Class 427			
39	B 476,837	C	Jan. 20, 1976
70	B 381,709	C	Jan. 13, 1976
145	B 457,547	C	Feb. 17, 1976
186	B 537,085	C	Feb. 17, 1976
207	B 501,415	C	Jan. 13, 1976
343	B 160,099	C	Jan. 13, 1976
372	B 409,848	C	Jan. 27, 1976
389	B 519,377	C	Jan. 27, 1976
Class 428			
73	B 481,737	C	Jan. 13, 1976
289	B 402,929	C	Feb. 3, 1976
315	B 373,354	C	Jan. 27, 1976
341	B 450,196	C	Feb. 10, 1976
428	B 554,655	C	Feb. 24, 1976
434	B 457,886	C	Jan. 13, 1976
515	B 474,747	C	Feb. 24, 1976
Class 431			
175	B 534,313	M	Jan. 27, 1976
264	B 398,220	M	Feb. 3, 1976

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 2ND DAY OF MARCH, 1976

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Ahlstrom Osakeyhtio: *See*—
Tuomaala, Jorma Aarne Kullervo, 3,941,435.

A B C Packaging Machine Corporation: *See*—
Reichert, Donald G., 3,941,037.

A. H. Robins Company: *See*—
Welstead, William John, Jr.; and Chen, Ying-Ho, 3,941,806.

A/S Cheminova: *See*—
Madsen, Hans Berg; Holst, Preben Lindholm; and Solli, Houk, 3,941,777.

A-T-O, Inc.: *See*—
Schnier, Edward A., 3,941,642.

Aarnio, Jaakko: *See*—
Hamalainen, Veikko; and Aarnio, Jaakko, 3,941,861.

Aarts, Jan: *See*—
Graham, Keith; Korsky, Viacheslav; Elmer, Christopher; Pinede, Edouard; Litster, John; and Aarts, Jan, 3,941,936.

Abbott, Thomas P., to United States of America, Agriculture. Method of preparing powdered elastomer compositions. 3,941,767, Cl. 260-17.200.

Abdel-Monem, Mahmoud M., to Zinpro Corporation. 1:1 Zinc methionine complexes. 3,941,818, Cl. 260-429.900.

Abe, Takeshi; and Fukushima, Yoshio, to Kabushiki Kaisha Ricoh. Roll film mark counter. 3,941,981, Cl. 235-92.00V.

Abolins, Arnold; Massar, Ernst; and Weghaupt, Erich, to Kraftwerk Union Aktiengesellschaft. Device for securing a superconductive exciter winding in the rotor of a turbogenerator. 3,942,053, Cl. 310-52.000.

Abraham, John C., to Caterpillar Tractor Co. Rotary spray cleaner for circular dies. 3,941,537, Cl. 425-228.000.

Acieries Reunies de Burbach-Eich-Dudelange S.A. ARBED: *See*—
Libert, Andre; and Francois, Gilbert, 3,940,941.

Ackerley, Norman; and Mack, Peter Albert, to Imperial Chemical Industries Limited. Quinoline 2 carboxylic acids used in metal extraction processes. 3,941,793, Cl. 260-287.00G.

Acord, Timothy T., to United States of America, Army. Modified rotary compressor yielding sinusoidal pressure wave outputs. 3,941,522, Cl. 418-61.00A.

Acoustic Fiber Sound Systems, Inc.: *See*—
Croup, Robert E., 3,941,207.

Adachi, Yoshiharu; and Kobashi, Uichiro, to Aisin Seiki Kabushiki Kaisha. Flow-divider valve. 3,941,142, Cl. 137-101.000.

Adams, Larry D. Wedging sawhorse stand. 3,941,209, Cl. 182-186.000.

Addis, Kenneth James: *See*—
Klein, Norman Edward; and Addis, Kenneth James, 3,941,644.

AEG-Elotherm G.m.b.H.: *See*—
Matthes, Hans; and Mauler, Erhard, 3,942,090.

Aerojet-General Corporation: *See*—
DePree, David O., 3,941,693.

Affiliated Hospital Products, Inc.: *See*—
Baldwin, Brian E., 3,941,128.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See*—
Lamarre, Jean-Michel, 3,941,991.

Agency of Industrial Science & Technology: *See*—
Akami, Hitoshi; Nishikawa, Shigeru; and Kawakami, Tatsuya, 3,942,154.
Tadakuma, Susumu; Inagaki, Junpei; and Tanaka, Shigeru, 3,942,085.

AGFA-Gevaert, A.G.: *See*—
Pelz, Willibald; Credner, Hans-Heinrich; Schulte, Walter; Klein, Alfons; Wedemeyer, Karlfried; and Nittel, Fritz, 3,941,601.
Ranz, Erwin; Lapp, Otto; Moisar, Erik; and von Rintelen, Harald, 3,941,595.
Schatka, Gunther; Kruger, Wilm; Paulus, Rudolf; Koleff, Boris; Pattis, Erich; and Hartwig, Karl, 3,941,471.

AGFA-GEVAERT N.V.: *See*—
Depoorter, Henri; and Moelants, Felix Jan, 3,941,602.
Duden, Emanuel Hubert, 3,941,246.
Timmerman, Daniel Maurice; Thijs, Victor Jan; De Winter, Walter Frans; Claes, Frans Henri; and Vandenabeele, Hubert, 3,941,727.
Van Goethem, Hugo Vital; Hazenbosch, Edwin Hendrik; and Poot, Albert Lucien, 3,941,598.

Agmen, Karl Gosta: *See*—
Gerber, Oskar; and Agmen, Karl Gosta, 3,941,205.

Ahlen, Karl Gustav, to S.R.M. Hydromekanik Aktiebolag. Resilient driving connections. 3,940,947, Cl. 64-14.000.

Ahmed, Adel Abdel Aziz, to RCA Corporation. Transient suppressor. 3,941,940, Cl. 179-18.0GF.

Aignesberger, Alois; and Bornmann, Paul, to Suddeutsche Kalkstickstoff-Werke Aktiengesellschaft. Process for preparing a sulfite modified melamine resin solution. 3,941,734, Cl. 260-29.40R.

Aillet, Claude, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Transcoder for digital differential phase modulation. 3,941,929, Cl. 178-67.000.

Air Distribution Associates, Inc.: *See*—
Kinney, David William, 3,941,039.

Air-O-Mulder B.V.: *See*—
Schutte, Hendrik, 3,941,118.

Air Products and Chemicals, Inc.: *See*—
Peterson, Lawrence Gordon, 3,941,687.

Airborne, S.A.: *See*—
Bernard, Charles, 3,941,418.

Aisin Seiki Kabushiki Kaisha: *See*—
Adachi, Yoshiharu; and Kobashi, Uichiro, 3,941,142.
Kuwana, Kazutaka, 3,941,429.
Torii, Tatsumi, 3,941,218.

Aiuola, Franco; and Rueff, Herbert. Apparatus for transferring bodies of delicate consistency from a feed line to a reception line. 3,941,233, Cl. 198-20.00R.

Akamatsu, Masahiko, to Mitsubishi Denki Kabushiki Kaisha. Commutation circuit and applications thereof. 3,942,094, Cl. 321-45.00C.

Akami, Hitoshi; Nishikawa, Shigeru; and Kawakami, Tatsuya, to Agency of Industrial Science & Technology. Method and apparatus for recognizing colored pattern. 3,942,154, Cl. 340-146.30B.

Akatsuka, Mitsuo: *See*—
Tomura, Teruichi; Akatsuka, Mitsuo; and Iyama, Hiroyuki, 3,942,070.

Akerlow, Earl V., to Akerlow Industries, Inc. Rotary drum pelletizer with removable liners. 3,941,536, Cl. 425-222.000.

Akerlow Industries, Inc.: *See*—
Akerlow, Earl V., 3,941,536.

Akiyama, Junichi, to Shimadzu Seisakusho Ltd. Apparatus for electrophoretic analysis. 3,941,678, Cl. 204-299.00R.

Akkerman, James William; and Akkerman, Jon Derek. Motorcycle dynamometer. 3,940,978, Cl. 73-117.000.

Akkerman, Jon Derek: *See*—
Akkerman, James William; and Akkerman, Jon Derek, 3,940,978.

Aladdin Manufacturing Company: *See*—
Hedlund, Harland R.; and Wethe, Harry K., 3,940,889.

Albertin, Michel, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Ventilating arrangement for steam flow vacuum pump. 3,941,512, Cl. 417-153.000.

Albrecht, Erhard, to Rheinstahl AG. Fluidized bed furnace for burning partly dehydrated sludge and method of burning sludge in a fluidized bed furnace. 3,941,065, Cl. 110-8.00F.

Albright & Wilson Limited: *See*—
Smith, Raymond Anthony; and Russell, Ralph Thomas, 3,941,896.

Aldecoa, Ramon Zubiaga; Lacombe, Arturo Aldecoa; Carles, Jose Maria Zubiaga; Salaverri, Javier Arostegui; and Borde, Damaso Urruticoechea, to Ascargo, S.A. Shifting tween deck structure for cargo vessels. 3,941,071, Cl. 114-72.000.

Aldrich, Paul Harwood, to Hercules Incorporated. Stable aqueous dispersions of hydrocarbon resins and water soluble polyaminopolyamide-epichlorohydrin resin as dispersing agent. 3,941,736, Cl. 260-29.6NR.

Aleksa, Peter: *See*—
Glass, Marvin I.; Katzman, Allison; and Aleksa, Peter, 3,940,879.

Alexander, Ernest John, to Sterling Drug Inc. 3-Halomethylcarbonyl-9-benzoyl-1,2,3,4-tetrahydrocarbazoles. 3,941,805, Cl. 260-315.000.

Alfred Kunz & Co.: *See*—
Schuhbauer, Albert; and Hieber, Otto, 3,941,607.

All Weather Truck Mirror Co., Inc.: *See*—
Emerick, Carl D.; and Davis, Daniel E., 3,940,822.

Allan, Benjamin W. Refractory ore beneficiation. 3,941,668, Cl. 204-105.00R.

Allen-Bradley Company: *See*—
Dummermuth, Ernst, 3,942,158.

Allen, George W.: *See*—
Lobello, John; and Allen, George W., 3,941,028.

Allen & Hanburys Limited: *See*—
Clarke, Robert William; Hartley, David; and Oxford, Alexander William, 3,941,785.

Alley, David Murray Underwood: *See*—
Hamilton, Ian Robert; and Alley, David Murray Underwood, 3,941,095.

Allgeier, Hans; and Gagneux, Andre, to Ciba-Geigy Corporation. 6-Substituted-11b-phenyl-3, 11bH-oxazirino[2,3-d]-s-triazol[4,3-a][1,4]benzodiazepines. 3,941,799, Cl. 260-308.00R.

Allied Chemical Corporation: *See*—
Blank, Zvi, 3,941,648.
Kurtz, Bruce E.; and Omelian, Anatoli, 3,941,568.
Sifniades, Stylianos; Boyle, William J., Jr.; and Van Peppen, Jan F., 3,941,776.
Spielman, Burton A., 3,941,270.

Allington, Jackson H. Rotary engine. 3,941,527, Cl. 418-196.000.

Allison, Ralph H., Jr., to General Electric Company. Expanded scale timer and method of operating such. 3,941,000, Cl. 74-3.500.

Allison, William D., to Ford Motor Company. Independent wheel suspension having suspension strut. 3,941,401, Cl. 280-96.20B.

Allred, Paul E.: *See—*
Drachenberg, Frederick G.; and Allred, Paul E., 3,941,890.
Aluminum Company of America: *See—*
Couchman, Richard, 3,941,570.
Alza Corporation: *See—*
Weinshenker, Ned M., 3,941,886.
Amada Company Ltd.: *See—*
Sato, Masao; and Majima, Hideji, 3,941,022.
Amano Corporation: *See—*
Sato, Reiji, 3,942,182.
Amax Inc.: *See—*
Norman, Telfer E.; and Stolk, Douglas A., 3,941,589.
Ambrose, Robert; and Noll, Lewis H., to Lance Engineering Co., Inc. Noncombustion engine. 3,940,932, Cl. 60-517.000.
Americal Corporation: *See—*
Bailey, Bill E., 3,941,285.
American Air Filter Company, Inc.: *See—*
Getzin, Allan R., 3,941,571.
American Aniline Products, Inc.: *See—*
Renfrew, Edgar E.; and Zanella, Dominic A., 3,941,560.
American Cyanamid Company: *See—*
Cross, Barrington; and Walworth, Bryant Leonidas, 3,941,881.
Tomcufcik, Andrew Stephen, 3,941,825.
American Device Manufacturing Company: *See—*
Ellingson, Chester W., Jr., 3,940,886.
American Flange & Manufacturing Co., Inc.: *See—*
Czerwiak, Marian A., 3,940,845.
American Home Products Corporation: *See—*
Sarantakis, Dimitrios, 3,941,763.
American Safety Equipment Corporation: *See—*
Ulrich, Charles J., 3,941,330.
Ameron, Inc.: *See—*
Robertson, Harry H.; Hicks, Donnie H.; and Hofmann, Hugh M., 3,941,347.
AMP Incorporated: *See—*
Bruni, Aldo; and Campari, Luigi, 3,941,444.
Anaconda Aluminum Co.: *See—*
Payne, Thomas F., 3,941,874.
Analog Devices, Inc.: *See—*
Wold, Ivar, 3,942,173.
Andersen, George L., to General Signal Corporation. Universal joint. 3,940,946, Cl. 64-8.000.
Anderson, A. D.; Lauridsen, Walter E.; and Overstreet, Charles L., to Iowa Beef Processors, Inc. Apparatus for breaking animal carcasses and handling meat products. 3,940,830, Cl. 17-24.000.
Anderson, Albert Edward, Jr., to Eastman Kodak Company. Stabilized oxichromic compounds. 3,941,816, Cl. 260-404.500.
Anderson, Clifford E. Air blowing machine. 3,940,818, Cl. 15-3.530.
Anderson, Donald R.: *See—*
Hoffmann, Karl H.; and Anderson, Donald R., 3,941,720.
Anderson, Edward J.; and Hinze, Franklin E. Spare tire lock. 3,940,959, Cl. 70-259.000.
Anderson, Frank R.; and Castro, Albert J., to Westates Space-Era Products, Inc. Flow control structure. 3,941,150, Cl. 137-504.000.
Anderson, James E.: *See—*
Balch, James L.; Anderson, James E.; and Sadeski, Boleslaus J., 3,941,234.
Anderson, Perry W.: *See—*
Glabe, Elmer F.; Anderson, Perry W.; Laftsidis, Stergios; and Grothus, Philip G., 3,941,893.
Anderson, Robert M.; and Sobieski, John C., to General Electric Company. Non-shorting photoflash lamp. 3,941,555, Cl. 431-93.000.
Ando, Masakatsu: *See—*
Masuda, Takashi; Sozaki, Shigeyuki; Ando, Masakatsu; and Oumi, Hideo, 3,941,637.
Andreev, Sergei Vasilievich; Leibenzon, Mikhail Grigorievich; Trushin, Jury Petrovich; and Luzgin, Mikhail Sergeevich. Collector for imagos and the eggs thereof. 3,941,089, Cl. 119-1.000.
Andrianov, Georgy Grigorievich: *See—*
Bondarenko, Oleg Petrovich; Medovar, Boris Izrailevich; Podola, Nikolai Vasilievich; Kravchuk, Anatoly Iosifovich; Marchenko, Alexandr Mikhailovich; Baglai, Vitaly Mikhailovich; Vernik, Alexandr Borisovich; Kamensky, Leonid Alexeevich; Us, Vasily Ivanovich; Mokhnach, Vladislav Konstantinovich; and Andrianov, Georgy Grigorievich, 3,942,105.
Anichini Cioni, Rovena: *See—*
Cioni, Elisabetta; Cioni, Lucia; and Anichini Cioni, Rovena, 3,940,909.
Anton, Steve M. Ball point pen. 3,941,490, Cl. 401-110.000.
Apenberg, Walter; Bohme, Georg; Fanger, Hans-Ulrich; Glaser, Benno; Hain, Klaus; Hubener, Jorg; Stegmaier, Winfried; Prech, Vaclav; and Vagner, Jaroslav, to Gesellschaft fur Kernforschung m.b.H. Method and apparatus for the in situ analysis of marine ore concretions. 3,942,003, Cl. 250-255.000.
Applied Inventions Corporation: *See—*
Kehler, Paul, 3,942,004.
Applied Materials, Inc.: *See—*
Schatz, Douglas S., 3,941,966.
Aqua-Chem, Inc.: *See—*
Steinbruchel, Armando B., 3,941,663.
Armac Enterprises, Inc.: *See—*
Bagley, Stuart C., 3,941,378.
Armor Elevator Company, Inc.: *See—*
Young, Christopher; and Maynard, John T., 3,941,214.
Armstrong Cork Company: *See—*
Drout, Frank G.; and Eyman, Douglas R., 3,941,636.
Fritz, Thomas W., 3,941,995.
Armstrong, Desmond Ross, to U.S. Philips Corporation. Interface receiver. 3,942,044, Cl. 307-290.000.
Arnold, Franz; and Preisenhammer, Peter, to Saurer-Allma GmbH, Allgaeuer Maschinenbau. Clamping device, in particular a machine vise. 3,941,362, Cl. 269-32.000.
Arnold & Richter KG, Firma: *See—*
Lohse, Paul, 3,941,287.
Arrigoni, Guido: *See—*
Vicentini, Arnaldo; Maschi, Francesco; and Arrigoni, Guido, 3,941,935.
Arteche, Instrumentacion y Sistemas Electronicos, S.A.: *See—*
Peral, Juan Jose Zubeldia; and Llona, Jose Luis Gomez, 3,942,166.
Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Nonaka, Kohei; Fukushima, Masayoshi; and Sakai, Kunio, 3,940,999.
Sumi, Momoki; Kanda, Goro; Iriguchi, Norio; Isohata, Susumu; and Sasaki, Kyoichi, 3,941,967.
Asaka, Urataro: *See—*
Yagi, Shizuo; and Asaka, Urataro, 3,941,105.
Asano, Hidejiro; and Hiromae, Yoshitaka, to Nippon Steel Corporation. Oil-coated metal sheet. 3,941,910, Cl. 428-457.000.
Asano, Shiro; Yoshimura, Kiyotaka; and Hashimoto, Masao, to Mitsui Toatsu Chemicals, Incorporated. Method of treating an aqueous solution of acrylamide. 3,941,837, Cl. 260-561.00N.
ASARCO Incorporated: *See—*
Stern, Melvin, 3,941,609.
Ascargo, S.A.: *See—*
Aldecoa, Ramon Zubiaga; Lacombe, Arturo Aldecoa; Carles, Jose Maria Zubiaga; Salaverri, Javier Arostegui; and Borde, Damaso Urruticoechea, 3,941,071.
Ash, David J.; and Colmey, John C., to International Telephone and Telegraph Corporation. Replacement of nonfat dry milk. 3,941,895, Cl. 426-549.000.
Ashland Oil, Inc.: *See—*
Skubon, Michael J., 3,941,743.
Assembly Machines, Inc.: *See—*
Stevens, Donald S., 3,940,839.
Atlantic Richfield Company: *See—*
Pratt, Richard J., 3,941,808.
Atlas Copco Aktiebolag: *See—*
Olofsson, Hans Kristoffer, 3,941,520.
Atlas Powder Company: *See—*
Janoski, Florian B., 3,941,056.
Atmos Corporation: *See—*
Morriss, James W., 3,942,041.
Audi NSU Auto Union Aktiengesellschaft: *See—*
Maurhoff, Gerhard; and Steinwart, Johannes, 3,940,927.
Seufer, Theo; and van Basshuysen, Richard, 3,941,097.
Wilmers, Gottlieb; and Maurhoff, Gerhard, 3,941,525.
Austin, Joseph R. Centrifugal fluid pump. 3,941,515, Cl. 417-240.000.
Australian Atomic Energy Commission: *See—*
Ekstrom, Alfred; and McLaren, Ashley Brooks, 3,941,870.
Auto Specialities Manufacturing Company: *See—*
Nehrig, R. Harlan; and White, Nicholas J., 3,941,352.
Automated Equipment Corporation: *See—*
Johannsmeier, Karl-Heinz, 3,941,294.
Automobiles Peugeot: *See—*
Dalencon, Andre, 3,941,273.
Giordano, Jean Louis; and Guettier, Michel, 3,941,431.
Rameau, Jean, 3,941,409.
Avco Corporation: *See—*
Shank, Wayne C., 3,941,501.
Aymami, Arthur L.: *See—*
Gardiner, William J., III; and Aymami, Arthur L., 3,941,005.
Ayres, Weldemar A., to Becton, Dickinson and Company. Plasma separator with centrifugal valve. 3,941,699, Cl. 210-117.000.
Azionaria Costruzioni Macchine Automatiche A.C.M.A. S.p.A.: *See—*
Maulini, Maurizio, 3,941,170.
Azurdata Inc.: *See—*
Azure, Leo L., 3,942,157.
Azure, Leo L., to Azurdata Inc. Data gathering formatting and transmitting system having portable data collecting device. 3,942,157, Cl. 340-172.500.
B. F. Goodrich Company, The: *See—*
Batiuk, Martin; Herman, Richard M.; and Healy, James C., 3,941,859.
Kletecka, George; and Forry, Mark E., 3,941,843.
Martindale, Troy E., 3,941,050.
Babcock & Wilcox Company, The: *See—*
Campbell, Frank, Jr., 3,941,160.
Jabsen, Felix S.; Schluderberg, Donald C.; and Paulson, Arnold E., 3,941,187.
Babiec, John S., Jr.; and Schnabel, Wilhelm J., to Olin Corporation. Process for the preparation of methylene-bridged diaryl isocyanates. 3,941,822, Cl. 260-453.00P.
Badger Meter, Inc.: *See—*
Krause, Marvin W.; Strobel, Donald H.; and Seruga, Edward A., 3,940,971.
Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See—*
Dimroth, Peter; and Dammert, Walter, 3,941,766.
Graser, Fritz, 3,941,742.
Kummer, Rudolf; Nienburg, Hans-Juergen; Hohenschutz, Heinz; Strohmeyer, Max; and Teutsch, Theo, 3,941,848.

Baglai, Vitaly Mikhailovich: *See—*
Bondarenko, Oleg Petrovich; Medovar, Boris Izrailevich; Podola, Nikolai Vasilievich; Kravchuk, Anatoly Iosifovich; Marchenko, Alexandr Mikhailovich; Baglai, Vitaly Mikhailovich; Vernik, Alexandr Borisovich; Kamensky, Leonid Alexeevich; Us, Vasily Ivanovich; Mokhnach, Vladislav Konstantinovich; and Andrianov, Georgy Grigorievich, 3,942,105.

Bagley, Stuart C., to Armac Enterprises, Inc. Convertible pool-dining table with retractable ball box. 3,941,378, Cl. 273-5.00R.

Baguelin, Yves, to Societe Anonyme de Vehicules Industriels et d'Equipement Mecaniques Saviem. Multicylinder heat engines. 3,941,113, Cl. 123-179.00R.

Bahder, George; and Eager, George S., Jr., to General Cable Corporation. High voltage flexible cable supported by a continuous rigid bridge for floating platforms. 3,942,031, Cl. 307-147.000.

BAI Corporation: *See—*
Dreyfus, Marc G., 3,941,484.

Bailey, Bill E., to Americal Corporation. Apparatus for producing panty hose. 3,941,285, Cl. 223-43.000.

Bailey, John M.; and Stratton, Michael K., to Caterpillar Tractor Co. Seal for rotating means. 3,941,396, Cl. 277-134.000.

Bainard, Dean R., to Garlock Inc. Seal method and article. 3,941,393, Cl. 277-9.500.

Baker, Donald H., to Sperry Rand Corporation. OMEGA-VOR/DME positional data computer for aircraft. 3,941,983, Cl. 235-150.270.

Baker, Douglas A.: *See—*
Stevinson, Harry T.; and Baker, Douglas A., 3,942,051.

Baker, Henry Louis, to Communications Patents Limited. Method and apparatus for effecting digital signalling over television signal channels. 3,941,919, Cl. 178-5.600.

Baker Hydro, Inc.: *See—*
Baker, William O.; and Johnson, Charles S., 3,940,807.

Baker, Richard H., to Massachusetts Institute of Technology. Multinode electrical network. 3,942,028, Cl. 307-66.000.

Baker, William O.; and Johnson, Charles S., to Baker Hydro, Inc. Safety suction outlet for pools. 3,940,807, Cl. 4-172.000.

Bakerdrill, Inc.: *See—*
Curington, Alfred R.; and Roscoe, Theodore J., Jr., 3,941,196.

Balamuth, Lewis; Rutten, Michael R.; and Meyer, Robert, to Ultrasonic Systems, Inc. Ultrasonic toothbrush applicator. 3,941,424, Cl. 300-21.000.

Balch, James L.; Anderson, James E.; and Sadeski, Boleslaus J., to Oscar Mayer & Co., Inc. Conveyor loading system. 3,941,234, Cl. 198-21.000.

Baldwin, Brian E., to Affiliated Hospital Products, Inc. Fluid dispensing arrangement. 3,941,128, Cl. 128-218.0NV.

Baldwin, Ralph B.; and Visser, James T., to Oliver Machinery Company. Method and apparatus for cutting lumber and the like. 3,941,019, Cl. 83-71.000.

Balinski, Henry A., to United States Gypsum Company. Stud having struck-out flanges and fire-rated wall structure formed therewith. 3,940,899, Cl. 52-481.000.

Balko, Jack E.; Blair, John E.; Bybee, Jerry L.; Fuhrmeister, William F.; and Kushmaul, Richard T., to Recognition Equipment Incorporated. Document transport and scanning system for optical character recognition. 3,942,153, Cl. 340-146.30F.

Ball, Rowland E.; and Wiese, Winfred J., to Borg-Warner Corporation. Cooled seal cartridge. 3,941,395, Cl. 277-41.000.

Balla, Gyula, to Tetra Pak International AB. Apparatus for the manufacture of laminated packing material containing metal foil. 3,941,643, Cl. 156-380.000.

Ballinger, Maurice Gordon; and Oakerbee, Raymond Mitchell, to S.T.B. Engineering Limited; and Oaktree Equipment Limited. Systems for the feeding of plastics materials to plastics working machines. 3,941,318, Cl. 241-101.400.

Ballini, Andre, to Regie Nationale des Usines Renault. Tool holder with controlled tool movement. 3,941,497, Cl. 408-155.000.

Bar-on, Ari: *See—*
Hattler, Louis R.; and Bar-on, Ari, 3,941,085.

Barabas, Eugene S.; and Grosser, Frederick, to GAF Corporation. Insoluble crosslinked homopolymers and copolymers, polymerized on an inert substrate. 3,941,718, Cl. 252-430.000.

Barbieri, Thomas; Getz, Edward J.; and Wilson, Alfred W., to Westinghouse Electric Corporation. Container for a lamp bulb or the like, and resulting package. 3,941,304, Cl. 229-39.00B.

Barbin, William W.; and Sanda, Joseph C., Jr., to Firestone Tire & Rubber Company, The. Method of dispersing carbon black in liquid elastomers. 3,941,740, Cl. 260-33.6AQ.

Bareham, Eric Gordon, to British Leyland UK Limited. Bucket tappets. 3,941,102, Cl. 123-90.520.

Barenschee, Wilhelm: *See—*
Semmler, Eduard O.; Guthling, Klaus; and Meyer, Adolf J. G., 3,941,055.

Barensfeld, Lothar Otto: *See—*
Haury-Wirtz, Ingeborg Maria; Barensfeld, Lothar Otto; and Callahan, George Edgar, 3,941,167.

Barnes, Clarence A., Jr.: *See—*
Ferrara, Peter J.; Dalby, Gaston; Barnes, Clarence A., Jr.; and Gordon, Roy, 3,941,712.

Barnett, Louis H. High strength multiple passageway plastic conduit. 3,941,157, Cl. 138-115.000.

Barowski, Gerhard: *See—*
Stut, Hans; and Barowski, Gerhard, 3,941,900.

Barr, Anthony J.; and Mullin, Alexander G., to National Association of Furniture Manufacturers, Inc. Apparatus for optimizing the yield of usable pieces from boards and the like. 3,942,021, Cl. 250-572.000.

Barrett, DeLoris Joan: *See—*
Peters, Jack; and Barrett, DeLoris Joan, 3,941,399.

Barrett, Joseph Edward, to British Petroleum Company Limited, The. Protection method. 3,940,940, Cl. 61-1.00R.

Barrow, John Samuel; Radcliffe, Allen; and Taylor, Donald, to Fosroc A.G. Electrical junction box assembly. 3,941,917, Cl. 174-65.0SS.

Barrus, Gordon B.; Emenaker, Leo J.; and Melissa, Raymond F., to Printronix, Inc. Printer system. 3,941,051, Cl. 101-93.040.

Barth, Hans Jochen, to Wacker-Chemie GmbH. Apparatus for the preparation of foamed thermoplastic extruded profiles. 3,941,544, Cl. 425-376.000.

Bartl, Herbert: *See—*
Huper, Fritz; Rauenbusch, Erich; Schmidt-Kastner, Gunter; Bomer, Bruno; and Bartl, Herbert, 3,941,756.

BASF Aktiengesellschaft: *See—*
Broecker, Franz Josef; Zirker, Guenter; Triebskorn, Bruno; Marosi, Laszlo; Schwarzmann, Matthias; Dethlefsen, Winfried; and Kaempfer, Knut, 3,941,721.
Fuchs, Hugo; Gath, Rudolph; Kahr, Kurt; and Kartte, Klaus, 3,941,838.
Hell, Renate Elisabeth; and Scheuermann, Horst, 3,941,791.
Herbeck, Rudolf; Kolk, Erich; Schweier, Guenther; Schick, Hans; and Urban, Friedrich, 3,941,760.
Szymanski, Hans Joachim; and Dockner, Toni, 3,941,844.

Basile, Mario J. Method of treating soil for controlling termites and the like. 3,940,875, Cl. 43-124.000.

Bassani, Giovanni, to Dow Corning Corporation. Mold injection adapter for low viscosity polymers. 3,941,169, Cl. 141-61.000.

Batiuk, Martin; Herman, Richard M.; and Healy, James C., to B. F. Goodrich Company, The. Thermoplastic polymer blends of EPDM polymer, polyethylene and ethylene-vinyl acetate copolymer. 3,941,859, Cl. 260-897.00B.

Battelle Development Corporation: *See—*
Russell, James T., 3,941,927.

Battelle Memorial Institute: *See—*
Mitchell, Drury K., 3,940,952.
Weis, Edmund B., Jr.; Hassler, Craig R.; and Flora, John H., 3,940,803.

Baum, Jesse J. Direct reduced iron. 3,941,582, Cl. 75-4.000.

Baumanis, Bruno, to Molex Incorporated. Terminal for apertured circuit panel. 3,941,449, Cl. 339-217.00S.

Baumann, Horst: *See—*
Klement, Gunter; Baumann, Horst; and Scheidt, Eugen, 3,941,907.

Baxter Laboratories, Inc.: *See—*
Mittleman, Herbert, 3,941,149.

Bayer Aktiengesellschaft: *See—*
Draber, Wilfried; Regel, Erik; Buchel, Karl-Heinz; Eue, Ludwig; and Schmidt, Robert R., 3,941,800.
Ehrhard, Fritz, 3,941,855.
Hagemann, Hermann, 3,941,873.
Hermann, Gunther; Hoffmann, Peter; Rosendahl, Friedrich-Karl; and Ugi, Ivar, 3,941,887.
Huper, Fritz; Rauenbusch, Erich; Schmidt-Kastner, Gunter; Bomer, Bruno; and Bartl, Herbert, 3,941,756.
Maassen, Dieter; Nast, Roland; Bormann, Heinrich; Piechota, Helmut; and Kraft, Karl-Josef, 3,941,769.
Wiedermann, Rolf; and La Spina, Andrea, 3,941,726.

Bayles, John J.; and Roster, Theodore J., to United States of America, Navy. Portable salvage lift. 3,940,814, Cl. 9-8.00R.

Baylor College of Medicine: *See—*
Melnick, Joseph L.; and Wallis, Craig, 3,941,696.

BBC Brown Boveri & Company Limited: *See—*
Kauferle, Josef; and Reichert, Konrad, 3,942,100.
Oberrettl, Kurt, 3,942,050.

Beatrice Foods Co.: *See—*
Kasik, Robert L.; and Peterson, Marvin A., 3,941,891.

Beavers, Allan E., to T. A. Pelsue Company. Foldable free-standing tent, frame and subframe therefor. 3,941,140, Cl. 135-4.00R.

Becchi, Raffaele; and Bisone, Dario, to Ing. C. Olivetti & C., S.p.A. Serial printing device. 3,941,229, Cl. 197-53.000.

Beckman Instruments, Inc.: *See—*
Ehret, Robert J.; Stephens, Donald E.; Durland, Douglas H.; and Sharples, Thomas D., 3,941,487.

Becton, Dickinson and Company: *See—*
Ayres, Waldemar A., 3,941,699.

Bedford, Robert E., to Scheu Manufacturing Company. Heater safety control system. 3,941,553, Cl. 431-80.000.

Beecham Group Limited: *See—*
Clayton, John Peter; Hardy, Kenneth David; and Guest, Angela Wendy Capel, 3,941,774.

Bell, David B.; and Cipher, John A., to Texas Instruments Incorporated. Digital tuning method and system. 3,942,121, Cl. 325-419.000.

Bell & Howell Company: *See—*
Carpenter, Ronald K.; and Ives, Gusti L., 3,941,333.
Figge, Erwin E.; Hapke, Kenyon A.; Karalus, George C.; and Lenell, Robert C., 3,941,465.
Huston, James E.; and Murre, Robert W., 3,941,978.
Matula, Jerry, 3,941,332.
Shah, Rashmikant P., 3,941,466.

Bell Telephone Laboratories, Incorporated: *See—*
Cho, Alfred Yi, 3,941,624.
Engstrom, John Gordon; and Petaja, Gary Merlin, 3,941,951.
Kaplan, Martin Louis; and Wudl, Fred, 3,941,809.

Bellia, Eugene Sauveur, to Etat Francais. Tool for extraction of a preformed fitting from a peripheral groove. 3,940,840, Cl. 29-235.000.

Bellino, Joseph A.; and von Braun, Leo, to Teletype Corporation. Backlash compensated linear drive method for lead screw-driven printer carriage. 3,941,230, Cl. 197-90.000.

Bendix Corporation, The: *See—*
Kluczynski, Matthew L., 3,941,350.

Benjamin, Edward C.: *See—*
Perrinelle, Alexandre G.; and Benjamin, Edward C., 3,940,842.

Benjamin, Milton L.; and Walker, David D., to Erickson Tool Company. Precision heavy duty indexer. 3,941,014, Cl. 74-826.000.

Bennett, Allan I., to Westinghouse Electric Corporation. Low frequency two phase oscillator including variable feedback integrator circuits. 3,942,131, Cl. 331-45.000.

Bensch, Gotthard; Ehrich, Gustav; and Fendler, Peter, to Volkswagenwerk Aktiengesellschaft. Apparatus for producing an engine-speed signal for an electronic fuel injection system. 3,941,100, Cl. 123-32.0EA.

Benton, Cecil Thomas; Freter, John Maher; and Moore, Robert R., to Hosmer/Dorrance Corporation. Ankle block. 3,940,804, Cl. 3-30.000.

Beretta, Angelo V.; and Beretta, David, to Durastone Company. Means for curving side by side concrete curb sections. 3,941,545, Cl. 425-383.000.

Beretta, David: *See—*
Beretta, Angelo V.; and Beretta, David, 3,941,545.

Bergen Laboratories, Inc.: *See—*
Bright, Thomas F., 3,942,176.

Berger, Abe: *See—*
De Zuba, George P.; Berger, Abe; and Selin, Terry G., 3,941,741.

Bergische Stahl-Industrie: *See—*
Ksiensyk, Klaus; and Chatterjee, Barun Kumar, 3,941,253.

Bernard, Charles, to Airborne, S.A. Upholstered seat. 3,941,418, Cl. 297-355.000.

Bernecker, Otto: *See—*
Borner, Manfred; Glasmachers, Gisbert; Bernecker, Otto; Riemann, Volker; and Maslowski, Stefan, 3,941,945.

Berrod, Francois; and Puverel, Fernand, to Thomson-CSF. Variable-gain amplifier. 3,942,181, Cl. 343-16.00M.

Bertocchio, Rene: *See—*
Foulletier, Louis; and Bertocchio, Rene, 3,941,705.

Best, Robert H.; and Harris, William D., to Burlington Industries, Inc. Method and system for maintaining an electrically neutral atmosphere. 3,942,072, Cl. 317-4.000.

Beuther, Harold; Chun, Sun W.; and Montagna, Angelo A., to Gulf Research & Development Company. Two stage metal-containing oil hydrodesulfurization process employing an activated alumina catalyst in the second stage. 3,941,683, Cl. 208-210.000.

Bezimensky, Alexandre. Hydrodynamic transmission system. 3,940,929, Cl. 60-330.000.

Bharucha, Nanabhai R.; and Claessens, Pierre L., to Noranda Mines Limited. Fluidized bed electrode system. 3,941,669, Cl. 204-105.00R.

Biddle, Joseph R. Vent pipe check valve. 3,941,151, Cl. 137-527.600.

Billi S.p.A.: *See—*
Romoli, Luciano, 3,940,954.

Binard, Edouard, to N. V. Bekaert S.A. Wire screens. 3,941,703, Cl. 210-499.000.

Bio-Derivatives Corporation: *See—*
Riccardi, Guy J., 3,941,835.

Bishop, Kenneth M. Swimming pool water circulation system. 3,941,154, Cl. 137-624.150.

Bishop, Thomas Desmond, to Deritend Engineering Co. Ltd., The. Die-cutting. 3,941,038, Cl. 93-58.400.

Bison, Gunter; Schubel, Hans; and Schmeling, Gerhard, to Dynamit Nobel Aktiengesellschaft. Process for obtaining D(−)-and L(+)-α-azidophenylacetic acid. 3,941,814, Cl. 260-349.000.

Bisone, Dario: *See—*
Becchi, Raffaele; and Bisone, Dario, 3,941,229.

Bjorksten, Johan; and Rock, Edward J. Continuous process for preparing unidirectionally reinforced metal foam. 3,941,182, Cl. 164-86.000.

Black, James A.; and Rop, James O., to Black, James A. Printing press. 3,941,053, Cl. 101-124.000.

Blair, John E.: *See—*
Balko, Jack E.; Blair, John E.; Bybee, Jerry L.; Fuhrmeister, William F.; and Kushmaul, Richard T., 3,942,153.

Blank, Albert I., to Chase Brass & Copper Co., Incorporated. Mechanical skimmer. 3,941,360, Cl. 266-37.000.

Blank, Zvi, to Allied Chemical Corporation. Crystal growth on Hg_3TeO_6. 3,941,648, Cl. 156-622.000.

Blanton, Elmer Ladelle: *See—*
Tucker, Gerald L.; and Blanton, Elmer Ladelle, 3,941,578.

Blanz, Roland, to Graubremse GmbH. Change-over valve for two-line trailer brake systems with at least one brake circuit. 3,941,432, Cl. 303-52.000.

Blinow, Igor; Johnson, Bruce K.; and Whiteside, George D., to Polaroid Corporation. Means and method for calibrating light responsive exposure control system. 3,942,184, Cl. 354-42.000.

Blom, Hubert Peter, to General Motors Corporation. Buckle component for a vehicle occupant restraint belt system. 3,941,419, Cl. 297-389.000.

Bloom, Harvey J.: *See—*
La White, Eric L.; Henrichon, Ernest G., Jr.; and Bloom, Harvey J., 3,941,375.

Blount, Richard; Cote, Paul T.; and Zukowski, Edward C., to General Electric Company. Flash array having shielded switching circuit. 3,941,992, Cl. 240-1.300.

BMR Security Products Corporation: *See—*
Walters, Russell W., 3,940,957.

Bobis, James P.: *See—*
McDowell, William P.; and Bobis, James P., 3,942,014.

Boehringer Ingelheim GmbH: *See—*
Renth, Ernst-Otto; Mentrup, Anton; Schromm, Kurt; and Danneberg, Peter, 3,941,789.

Boeing Company, The: *See—*
Cole, James B., 3,941,334.

Boghosian, Paul B. Switch receptacle. 3,941,915, Cl. 174-48.000.

Bohme, Georg: *See—*
Apenberg, Walter; Bohme, Georg; Fanger, Hans-Ulrich; Glaser, Benno; Hain, Klaus; Hubener, Jorg; Stegmaier, Winfried; Prech, Vaclav; and Vagner, Jaroslav, 3,942,003.

Bok, Peter: *See—*
Heimbrand, Eberhard; and Bok, Peter, 3,941,173.

Bollert, Ulrich: *See—*
Kleiner, Hans-Jerg; Finke, Manfred; Bollert, Ulrich; and Herwig, Walter, 3,941,752.

Bolt Beranek and Newman, Inc.: *See—*
Jones, Joie P., 3,941,122.

Bolto, Brian Alfred, to ICI Australia Limited; and Commonwealth Scientific and Industrial Research Organization. Production of amphoteric resins in a reaction medium comprising formic acid. 3,941,724, Cl. 260-2.10R.

Bolz, Egon: *See—*
Lauhoff, Theodor; Quante, Manfred; Stickel, Kurt Erwin; Bolz, Egon; and Semma, Klaus, 3,940,996.

Bomer, Bruno: *See—*
Huper, Fritz; Rauenbusch, Erich; Schmidt-Kastner, Gunter; Bomer, Bruno; and Bartl, Herbert, 3,941,756.

Bondarenko, Oleg Petrovich; Medovar, Boris Izrailevich; Podola, Nikolai Vasilievich; Kravchuk, Anatoly Iosifovich; Marchenko, Alexandr Mikhailovich; Baglai, Vitaly Mikhailovich; Vernik, Alexandr Borisovich; Kamensky, Leonid Alexeevich; Us, Vasily Ivanovich; Mokhnach, Vladislav Konstantinovich; and Andrianov, Georgy Grigorievich. Non-contact inductive pickup for determining the interface between two media. 3,942,105, Cl. 324-34.00R.

Bonometti, Emil: *See—*
Wittwer, Christian; and Bonometti, Emil, 3,941,765.

Bonsky, Elmer C., to T.A.D. Avanti, Inc. Telephone answering system. 3,941,934, Cl. 179-6.00R.

Booth, Newell O.; Saltzer, Benjamin A.; Thorn, James V.; and Sutton, Jerry L., to United States of America, Navy. Correction of spatial non-uniformities in sonar, radar, and holographic acoustic imaging systems. 3,942,150, Cl. 340-5.00H.

Borde, Damaso Urruticoechea: *See—*
Aldecoa, Ramon Zubiaga; Lacombe, Arturo Aldecoa; Carles, Jose Maria Zubiaga; Salaverri, Javier Arostegui; and Borde, Damaso Urruticoechea, 3,941,071.

Borg-Warner Corporation: *See—*
Ball, Rowland E.; and Wiese, Winfred J., 3,941,395.

Bormann, Heinrich: *See—*
Maassen, Dieter; Nast, Roland; Bormann, Heinrich; Piechota, Helmut; and Kraft, Karl-Josef, 3,941,769.

Borner, Manfred; Glasmachers, Gisbert; Bernecker, Otto; Riemann, Volker; and Maslowski, Stefan, to TED Bildplatten Aktiengesellschaft, AEG-Telefunken, TELDEC. Signal playback system transducer with optical resonance cavity. 3,941,945, Cl. 179-100.30Z.

Bornmann, Paul: *See—*
Aignesberger, Alois; and Bornmann, Paul, 3,941,734.

Borodin, Daniel J., to New York Wire Mills Corporation. Self-compensating die. 3,940,963, Cl. 72-78.000.

Borowiec, Richard A.: *See—*
Thomas, Howard M.; and Borowiec, Richard A., 3,941,023.

Borror, Alan L., to Polaroid Corporation. Indole dehydro phthalides and naphthalides. 3,941,807, Cl. 260-326.13R.

Bosch, Erhard; Pirson, Ewald; and Roth, Michael, to Wacker-Chemie GmbH. Method for manufacturing molded structures and coatings based on inorganic binding agents. 3,941,864, Cl. 264-256.000.

Bosshard, Peter; Portmann, Werner; and Wust, Olivier, to Rieter Machine Works Ltd. Winding device with automatic tube change operation. 3,941,321, Cl. 242-18.00A.

Bostroem, Theodore. Hot dip metallizing process. 3,941,906, Cl. 427-360.000.

Botnick, Irlin H. Drainable shutoff valve with filter. 3,941,152, Cl. 137-549.000.

Bourbeau, Frank J.; Meredith, Barton L.; and Witten, Arthur L., to General Motors Corporation. Cycloconverter controlled rectifier protection circuit. 3,942,092, Cl. 321-11.000.

Bourne, Joseph R., to Carrier Corporation. Electrolytic regeneration cell. 3,941,677, Cl. 204-272.000.

Boux, Rene, to C.G.R.-Mev. System for monitoring the position, intensity, uniformity and directivity of a beam of ionizing radiation. 3,942,012, Cl. 250-385.000.

Bowden, James E.; and Kesterson, Robert H., to Wheat, Richard P. Wire lead straightening device. 3,941,165, Cl. 140-147.000.

Bowmar Instrument Corporation: *See—*
Yoder, Alan C., 3,941,964.

Bowness, Colin: *See—*
Luck, Clarence F., Jr.; and Bowness, Colin, 3,941,973.

Boyce, Walter A., to Westinghouse Electric Corporation. Fast-firing ceramic composition and ceramic article made therefrom. 3,941,604, Cl. 106-39.500.

Boyle, William J., Jr.: *See*—
Sifniades, Stylianos; Boyle, William J., Jr.; and Van Peppen, Jan F., 3,941,776.

Bradbury, Christopher Grover; Gotham, Stanley Thomas; and Wudyka, Joseph Paul, to Leesona Corporation. Scrap salvage system. 3,941,684, Cl. 209-3.000.

Braden, Denver, to Illinois Tool Works Inc. Axial lead component feeder with anti-bunching mechanism. 3,941,242, Cl. 198-254.000.

Bradshaw, Kenneth E. Adjustable soaker hose support assembly. 3,941,342, Cl. 248-88.000.

Braginetz, Paul A., to Philip Morris Incorporated. Magazine for razor blade cartridges. 3,941,244, Cl. 206-360.000.

Brand, John R.; and Mate, David J., to Warwick Electronics, Inc. Electrical musical instrument with automatic sequential tone generation. 3,941,024, Cl. 84-1.010.

Brede, Uwe: *See*—
Gawlick, Heinz; and Brede, Uwe, 3,941,058.

Breford, Glenn H., to Midway Industries, Inc. Fifth wheel trailer hitch. 3,941,407, Cl. 280-415.00A.

Bresler, Burt, to Signode Corporation. Solid state motor control system. 3,942,086, Cl. 318-447.000.

Breslow, David S., to Hercules Incorporated. Epoxy-azido compounds. 3,941,751, Cl. 260-75.00T.

Bridgestone Tire Company Limited: *See*—
Yukuta, Toshio; Ohashi, Takashi; and Yoshsii, Hiroshi, 3,941,732.
Yukuta, Toshio; Kojima, Minoru; Onishi, Akira; and Kanbara, Shu, 3,941,847.

Bright, Thomas F., to Bergen Laboratories, Inc. Ultrasonic alarm system. 3,942,176, Cl. 340-416.000.

Brimacombe, J. Keith: *See*—
Wilkomirsky, Igor A.; Watkinson, Alan Paul; and Brimacombe, J. Keith, 3,941,867.

Brindell, Gordon D.; and Wuskell, Joseph P., to Quaker Oats Company, The. $\alpha,\alpha,\alpha',\alpha'$-tetrakis(4-hydroxy-3,5-disubstituted phenyl)xylene. 3,941,850, Cl. 260-619.00A.

Brinkmann, Bernd; and Griebsch, Eugen, to Schering Aktiengesellschaft. Prepolymers of polyisocyanates with hydroxy-enamines or hydroxy-ketimines. 3,941,753, Cl. 260-77.5MA.

Bristol-Myers Company: *See*—
Silvestri, Herbert H.; and Johnson, David A., 3,941,773.

British Aircraft Corporation Limited: *See*—
Nangia, Rajendar Kumar, 3,941,336.

British Leyland UK Limited: *See*—
Bareham, Eric Gordon, 3,941,102.

British Petroleum Company Limited, The: *See*—
Barrett, Joseph Edward, 3,940,940.

Britt, Russell, to Lawrence Peska Associates, Inc., a part interest. Container crusher. 3,941,049, Cl. 100-274.000.

Britton, Richard B.: *See*—
McMackin, Raymond F.; Britton, Richard B.; and Robins, Kenneth E., 3,940,819.

Brock, Alan J. Charging of electrophotographic surfaces. 3,942,079, Cl. 317-262.00A.

Brodesser, Gerd R., to Xerox Corporation. Free floating belt tensioner. 3,941,006, Cl. 74-242.10R.

Broecker, Franz Josef; Zirker, Guenter; Triebskorn, Bruno; Marosi, Laszlo; Schwarzmann, Matthias; Dethlefsen, Winfried; and Kaempfer, Knut, to BASF Aktiengesellschaft. Catalyst for the manufacture of gases containing methane. 3,941,721, Cl. 252-466.00J.

Brogdon, Glenn F., Jr. Quick-release roller attachment for supporting a rope or hose and the like on an aerial ladder. 3,941,341, Cl. 248-55.000.

Brooks, Fred A. Four-wire interface regulator for long distance trunk circuits. 3,941,948, Cl. 179-170.00R.

Brown, Boveri & Cie., AG: *See*—
Kanngiesser, Karl Werner, 3,942,089.

Brown, George Seward. Shift lever handle. 3,941,009, Cl. 74-473.00R.

Brown, R. Bernard: *See*—
Fluhr, Frederick R.; Hanley, Stephen T.; and Brown, R. Bernard, 3,942,127.

Broxterman, David F.: *See*—
Sirocka, Richard L.; and Broxterman, David F., 3,942,043.

Bruder, Robert G. Injection mold assembly. 3,941,548, Cl. 425-450.100.

Bruel, Andre, to Costruzioni Aeronautiche Giovanni Agusta S.p.A. Helicopter rotor hub provided with flexible elements such as virtual hinges. 3,941,503, Cl. 416-141.000.

Brumshagen, Harald: *See*—
Kind, Dieter; and Brumshagen, Harald, 3,942,103.

Brunetti, Heimo: *See*—
Dexter, Martin; Knell, Martin; and Brunetti, Heimo, 3,941,745.

Bruni, Aldo; and Campari, Luigi, to AMP Incorporated. Sealing member. 3,941,444, Cl. 339-60.00M.

Bryan, James W., to VCA Corporation. Flat top one-hand cylindrical lipstick case. 3,941,489, Cl. 401-59.000.

Bryson, Millard C.; Murphy, Harry C., Jr.; Murphy, James R.; and Stauffer, Harry C., to Gulf Research & Development Company. Lube oil hydrotreating process. 3,941,680, Cl. 208-80.000.

Brzozowski, Henri: *See*—
Franco, Pierre; and Brzozowski, Henri, 3,942,137.

Bucalo, Louis, to Neuronyx Corporation. Method for artificially inducing urination, defecation, or sexual excitation. 3,941,136, Cl. 128-422.000.

Buchanan, John K., to Motorola, Inc. MOS DC Voltage booster circuit. 3,942,047, Cl. 307-297.000.

Buchanan, John K., to Motorola, Inc. Pre-conditioning circuits for MOS integrated circuits. 3,942,162, Cl. 340-173.00R.

Buchel, Karl-Heinz: *See*—
Draber, Wilfried; Regel, Erik; Buchel, Karl-Heinz; Eue, Ludwig; and Schmidt, Robert R., 3,941,800.

Buchi, George Hermann, to Firmenich SA. Process for the preparation of cyclic ketones. 3,941,828, Cl. 260-468.00K.

Buchner, Heinrich, to Klockner-Humboldt-Deutz Aktiengesellschaft. Thermal treatment of granular or lumpy material, particularly firing lime, dolomite, magnesite or the like and furnace therefor. 3,941,557, Cl. 432-17.000.

Buchner, Helmut, to Daimler-Benz Aktiengesellschaft. Method for preparation of deuterium by isotope separation. 3,940,912, Cl. 55-16.000.

Budreau, Alan J.: *See*—
Laker, Kenneth R.; Budreau, Alan J.; and Carr, Paul H., 3,942,140.

Bukac, Zbynek; and Sebenda, Jan, to Ceskoslovenska Akademie Ved. Preparing polyamides by anionic polymerization of lactams. 3,941,754, Cl. 260-78.00L.

Bunker Ramo Corporation: *See*—
Niznik, Emil John, 3,940,921.

Bunning, John G., to Esterline Corporation. Flexible chart feeding guide or chute. 3,941,290, Cl. 226-83.000.

Buonanno, Samuel S., to Schlegel Corporation. Flexible continuous mold system. 3,941,543, Cl. 425-371.000.

Burckhardt, Manfred H.; Krohn, Hellmut; Grossner, Horst; and Florus, Hans-Jorg, to Daimler-Benz Aktiengesellschaft. Brake force control system for vehicles especially motor vehicles. 3,942,036, Cl. 307-229.000.

Burgdorf, Jochen, to ITT Industries, Inc. Brake shoe support for a spot-type disc brake. 3,941,216, Cl. 188-72.400.

Burgess Industries Incorporated: *See*—
Halter, Edmund John, 3,941,206.

Burkl, Erich: *See*—
Schurger, Rainer; Burkl, Erich; and Walter, Lothar, 3,941,434.

Burlington Industries, Inc.: *See*—
Best, Robert H.; and Harris, William D., 3,942,072.

Burmah Oil and Gas Company: *See*—
Kelly, Edward H.; and Kartinen, Ernest O., 3,940,832.

Burns, John Andrew; and Sivo, Andrew Robert, Jr., to Western Electric Company, Inc. Method and apparatus for simultaneously bonding a plurality of lead frames to a plurality of planar articles. 3,941,297, Cl. 228-180.00A.

Burroughs Corporation: *See*—
Goyal, Deepak K., 3,942,163.
Harvey, Edgar L., 3,942,060.
Morse, Robert Spitler, 3,941,916.

Burton, Robert S., III; Cha, Chang Yul; and Ridley, Richard D., to Occidental Petroleum Corporation. Apparatus for obtaining uniform gas flow through an in situ oil shale retort. 3,941,421, Cl. 299-2.000.

Busatto, Vinicio; and Franchi, Luigi, to Minnesota Mining and Manufacturing Company. Method for obtaining a color contrast photographic image, photographic element and development composition suitable for the realization of said method. 3,941,599, Cl. 96-66.300.

Busch, Albert E.; and Hotsenpiller, John R., to Sarkes Tarzian, Inc. Digital soft edge video transition system. 3,941,925, Cl. 178-6.800.

Buschkamp, Heinz, to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft. Coaxial high frequency cable. 3,941,913, Cl. 174-23.00R.

Buss, Dennis D., to Texas Instruments Incorporated. Charge transfer device for frequency filtering respective time segments of an input signal. 3,942,034, Cl. 307-221.00D.

Buss, Dennis Darcy, to Texas Instruments Incorporated. Charge coupled device signal processing apparatus using chirp-Z-transform techniques. 3,942,035, Cl. 307-221.00D.

Busschers, Franciscus A.: *See*—
Schoen, Lowhardt A. A.; and Busschers, Franciscus A., 3,941,909.

Busse, Oswald: *See*—
Stahl, Ulrich; Busse, Oswald; Klesper, Hugo; and Junker, Werner, 3,941,701.

Butement, William Alan Stewart. Electro-photographic method and element. 3,941,593, Cl. 96-1.500.

Buttner, Peter. Plow dolly. 3,941,400, Cl. 280-79.100.

Bybee, Jerry L.: *See*—
Balko, Jack E.; Blair, John E.; Bybee, Jerry L.; Fuhrmeister, William F.; and Kushmaul, Richard T., 3,942,153.

Bybee, William Dennis: *See*—
Roth, Clarence Edward, Jr.; Lasswell, Joseph Arnold; Bybee, William Dennis; and Parker, Earl Brewer, Jr., 3,941,747.

Byers Photo Equipment Company: *See*—
Petry, Chester H., Jr.; and Hensley, J. Carl, 3,941,646.

Byrne, Paul Bradway, to Engelhard Minerals & Chemicals Corporation. Cell balance detector for electrolytic cell assemblies. 3,942,104, Cl. 324-30.00R.

Byrum, Bernard W., Jr.; and Ernsthausen, Roger E., to Owens-Illinois, Inc. Selective control of discharge position in gas discharge display/memory device. 3,942,161, Cl. 340-173.0PL.

C.A.V. Limited: *See*—
Fenne, Ivor, 3,941,282.

C G R Alexandre: *See*—
Hubert, Jean, 3,941,993.

C.G.R.-Mev: *See*—
Boux, Rene, 3,942,012.

Caldwell, Charles W.: *See—*
Parker, Bernard I.; and Caldwell, Charles W., 3,941,452.
Calgon Corporation: *See—*
Hollingshad, William Robert, 3,941,562.
California Microwave, Inc.: *See—*
Ferguson, Myron E., 3,942,116.
Callahan, George Edgar: *See—*
Haury-Wirtz, Ingeborg Maria; Barensfeld, Lothar Otto; and Callahan, George Edgar, 3,941,167.
Calspan Corporation: *See—*
Weatherston, Roger C., 3,941,521.
Cambria, Emanuel F., to Hurst Performance, Inc. Shift mechanism for automatic transmission. 3,941,008, Cl. 74-473.00R.
Camelon, Melville J.; and Gibeau, Rodney C., to Ford Motor Company. Powder paints containing aluminum and nickel II. 3,941,731, Cl. 260-17.00R.
Campari, Luigi: *See—*
Bruni, Aldo; and Campari, Luigi, 3,941,444.
Campbell, Frank, Jr., to Babcock & Wilcox Company, The. Interlocking ceramic tile for covering an insulated water cooled pipe structure. 3,941,160, Cl. 138-178.000.
Canadian General Electric Company Limited: *See—*
Tarasuk, Walter Renald; and Yonemitsu, Isao David, 3,941,654.
Canadian Patents and Development Limited: *See—*
Stevinson, Harry T.; and Baker, Douglas A., 3,942,051.
Wilkomirsky, Igor A.; Watkinson, Alan Paul; and Brimacombe, J. Keith, 3,941,867.
Canadian Porcelain Company Limited: *See—*
Nigol, Olaf; and Rosenblatt, Gordon, 3,941,918.
Cannell, Roger D.: *See—*
Louis, Joseph E.; and Cannell, Roger D., 3,941,514.
Canon Kabushiki Kaisha: *See—*
Hanada, Hiroshi; Kitajima, Nobuo; and Masaki, Tatsuo, 3,941,591.
Cantwell, Joseph R., to Sperry Rand Corporation. Electrical connector. 3,941,446, Cl. 339-75.00M.
Cardenas, Ricardo L.: *See—*
Carlin, Joseph T.; and Cardenas, Ricardo L., 3,941,192.
Carles, Jose Maria Zubiaga: *See—*
Aldecoa, Ramon Zubiaga; Lacombe, Arturo Aldecoa; Carles, Jose Maria Zubiaga; Salaverri, Javier Arostegui; and Borde, Damaso Urruticoechea, 3,941,071.
Carlin, Joseph T.; and Cardenas, Ricardo L., to Texaco Inc. Method for recovering high asphaltene content petroleum using surfactants. 3,941,192, Cl. 166-304.000.
Carlson, Arthur W., to E. H. Sheldon and Company. Fume hood. 3,941,040, Cl. 98-115.0LH.
Carlson, Richard D.: *See—*
Maul, James J.; and Carlson, Richard D., 3,941,758.
Carlton Company: *See—*
Ogg, Dustin Lance, 3,941,363.
Carmichael, Thomas F.; and Maier, Richard J., to Syncro Corporation. Ignition system. 3,941,111, Cl. 123-148.00E.
Carpenter, Hubert T. Hose handling apparatus. 3,941,412, Cl. 294-74.000.
Carpenter, Ronald K.; and Ives, Gusti L., to Bell & Howell Company. Web cartridge. 3,941,333, Cl. 242-197.000.
Carr, Albert A.; and Kinsolving, C. Richard, to Richardson-Merrell Inc. α-aryl-4-substituted piperidinoalkanol derivatives. 3,941,795, Cl. 260-293.830.
Carr, Paul H.: *See—*
Laker, Kenneth R.; Budreau, Alan J.; and Carr, Paul H., 3,942,140.
Carrier Corporation: *See—*
Bourne, Joseph R., 3,941,677.
Robb, Raymond R.; and Sood, Vijay K., 3,941,506.
Carter, Frank H. Wind turbine with governor. 3,942,026, Cl. 290-55.000.
Carter-Wallace, Inc.: *See—*
MacGregor, Fred M., Jr., 3,941,237.
Carulli, Vincent J.: *See—*
Webster, Ronald B.; Carulli, Vincent J.; and Wood, Kenneth O., 3,941,480.
Caruth, James R.: *See—*
Voross, Zoltan; Caruth, James R.; and Leung, Yam C., 3,940,977.
Casazza, John A. Power injector control means for transmission networks. 3,942,032, Cl. 307-148.000.
Case, Cecil L.: *See—*
Garrison, Harold Keith; Case, Cecil L.; and White, Allen A., 3,941,003.
Castro, Albert J.: *See—*
Anderson, Frank R.; and Castro, Albert J., 3,941,150.
Caterpillar Tractor Co.: *See—*
Abraham, John C., 3,941,537.
Bailey, John M.; and Stratton, Michael K., 3,941,396.
Durham, Donald F.; and McFeeters, Robert D., 3,940,938.
Flesburg, Edward E., 3,941,958.
Moser, Raymond L.; and Volle, Everette Michael, 3,941,262.
Myers, Allen D., 3,941,219.
Oldenburg, Dorrance, 3,941,174.
Renfro, Kenneth W.; and Guhl, Richard E., 3,940,931.
Stedman, Robert N., 3,941,195.
Webber, Philip S.; and Franz, Maurice F., 3,941,007.
Caton, Dolphus D.; and Ralph, John R. Steering system for canoes. 3,941,072, Cl. 114-165.000.
Caule, Elmer J., to Olin Corporation. Method of producing tarnish resistant copper and copper alloys and products thereof. 3,941,627, Cl. 156-3.000.
Caule, Elmer J., to Olin Corporation. Method of producing tarnish resistant copper and copper alloys and products thereof. 3,941,628, Cl. 156-3.000.
Cawood, George H., to General Electric Company. Multi-gun cathode ray tube convergence system. 3,942,067, Cl. 315-13.00C.
Cellarius, Hans Joerg: *See—*
Sturm, Elmar; Cellarius, Hans Joerg; and Vogel, Christian, 3,941,579.
Central Soya Company, Inc.: *See—*
Orlowski, Gerald J., 3,941,538.
Centrala Industriala de Fibre Chimice: *See—*
Rotaru, Cornel Constantin N., 3,941,840.
Cerne, Gerd: *See—*
Molter, Gunther; and Cerne, Gerd, 3,941,337.
Cerola, Joseph J.; and Jenn, Louis J., to Jenn Air Corporation. Range with removable deep fat fryer unit. 3,941,043, Cl. 99-339.000.
Ceskoslovenska Akademie Ved: *See—*
Bukac, Zbynek; and Sebenda, Jan, 3,941,754.
Cha, Chang Yul: *See—*
Burton, Robert S., III; Cha, Chang Yul; and Ridley, Richard D., 3,941,421.
Chakrabarti, Paritosh Mohan, to GAF Corporation. Tertiary amide amphoteric surface active agents and process for their manufacture. 3,941,817, Cl. 260²404.500.
Champion Spark Plug Company: *See—*
Green, Sam J.; and Raeske, Frank J., 3,940,987.
Chandler Evans Inc.: *See—*
Duckworth, Allen; and Hearn, Richard J., 3,941,498.
Chang, Joe H-S, to Minnesota Mining and Manufacturing Company. Silanol-containing urethane dispersions. 3,941,733, Cl. 260-29.20M.
Chapel, James Frederick. Apparatus for removing anesthetic gases. 3,941,573, Cl. 55-316.000.
Chapman, Richard D.; Holmer, Donald A.; Pickett, Oscar A., Jr.; and Saunders, James H., to Monsanto Company. Fiber-forming 6TA/6IA copolymers. 3,941,755, Cl. 260-78.00R.
Chappell, Peter; Hicks, Burnette W.; and Gilbert, Gerald M., to Texas Instruments Incorporated. Satellite radio ranging velocity navigation. 3,941,984, Cl. 235-150.270.
Chas. S. Tanner Co.: *See—*
Lindemann, Martin K., 3,941,735.
Charlton, Thomas, to Westinghouse Electric Corporation. Dynamoelectric machine with improved lubrication wicking system. 3,941,438, Cl. 308-132.000.
Chartet, Andre, to Societe Anonyme des Usines Chausson. Brazing jig for aluminum radiator cores. 3,941,293, Cl. 228-44.10R.
Chase Brass & Copper Co., Incorporated: *See—*
Blank, Albert I., 3,941,360.
Chatard, Michel; Grolet, Pierre; Reynard, Remi; and Thiery, Jean, to Institut Francaise du Petrole, des Carburants et Lubrifiants. Apparatus for storing a flexible elongated member, such as a flexible drill column. 3,941,146, Cl. 137-355.160.
Chattem Drug & Chemical Company: *See—*
Shevlin, Edward J., 3,941,722.
Chatterjee, Barun Kumar: *See—*
Ksiensyk, Klaus; and Chatterjee, Barun Kumar, 3,941,253.
Chemplex Company: *See—*
Pullukat, Thomas J.; Shida, Mitsuzo; and Gillilan, Robert L., 3,941,761.
Chen, James Ling, to E. R. Squibb & Sons, Inc. Stomal devices having controlled release. 3,941,133, Cl. 128-283.000.
Chen, Ying-Ho: *See—*
Welstead, William John, Jr.; and Chen, Ying-Ho, 3,941,806.
Chevron Research Company: *See—*
Edwards, Laroy H., 3,941,884.
Chipp, Douglas Frank; and Delorme, Raymond. Containers with reclosable opening means. 3,941,305, Cl. 229-44.00R.
Chiyoda Chemical Engineering & Construction Co. Ltd.: *See—*
Yamamoto, Shizuo; Nagai, Yuichi; Shimizu, Nobuyuki; and Tajimi, Hiroshi, 3,940,895.
Cho, Alfred Yi, to Bell Telephone Laboratories, Incorporated. Sn-Doped group III(a)-v(a) Ga-containing layers grown by molecular beam epitaxy. 3,941,624, Cl. 148-175.000.
Choly, Mitchell, to General Motors Corporation. Apparatus for loading and securing vehicles in a shipping container. 3,941,064, Cl. 105-368.00R.
Chou, Seifun: *See—*
Okauchi, Tetsuo; Takamuku, Shoji; Tamura, Saburo; and Chou, Seifun, 3,941,879.
Christiansen, Paul, to Hayes-Albion Corporation. Knitting machine control. 3,940,951, Cl. 66-50.00R.
Chun, Sun W.: *See—*
Beuther, Harold; Chun, Sun W.; and Montagna, Angelo A., 3,941,683.
Ciambrone, David F., to Cubic Corporation. Corona discharge ozone generator. 3,942,020, Cl. 250-539.000.
Ciba-Geigy AG: *See—*
Hubele, Adolf, 3,941,832.
Hubele, Adolf, 3,941,839.
Stocker, Emil, 3,941,768.
Wittwer, Christian; and Bonometti, Emil, 3,941,765.
Ciba-Geigy Corporation: *See—*
Allgeier, Hans; and Gagneux, Andre, 3,941,799.
Dexter, Martin; Knell, Martin; and Brunetti, Heimo, 3,941,745.

Gschwend, Heinz Werner; and Hillman, Malvin J., 3,941,883.
Ilvespaa, Atso; Gagneux, Andre; Schweizer, Ernst; and Frei, Jorg, 3,941,804.
Pissiotas, Georg; and Durr, Dieter, 3,941,829.
Schmitter, Andre; Hugi, Rolf; and Seiz, Wolfgang, 3,941,725.
Stephen, John F., 3,941,746.
Sturm, Elmar; Cellarius, Hans Joerg; and Vogel, Christian, 3,941,579.
Woodward, Robert Burns, 3,941,813.

Cinkus, Frank: *See—*
Holmes, Phillip L.; Cinkus, Frank; and Green, John Hugh, 3,941,939.

Cioni, Elisabetta; Cioni, Lucia; and Anichini Cioni, Rovena. Machine for filling and sealing glass vials starting from closed vials. 3,940,909, Cl. 53-167.000.

Cioni, Lucia: *See—*
Cioni, Elisabetta; Cioni, Lucia; and Anichini Cioni, Rovena, 3,940,909.

Cipher, John A.: *See—*
Bell, David B.; and Cipher, John A., 3,942,121.

Citizen Watch Co., Ltd.: *See—*
Yasuda, Tetuya; Yoshida, Makoto; Mochizuki, Yoshifumi; and Morokawa, Shigeru, 3,940,919.

CKD Praha, oborovy podnik: *See—*
Hyanova, Blanka; and Plasil, Vladimir, 3,942,049.

Claes, Frans Henri: *See—*
Timmerman, Daniel Maurice; Thijs, Victor Jan; De Winter, Walter Frans; Claes, Frans Henri; and Vandenabeele, Hubert, 3,941,727.

Claessens, Pierre L.: *See—*
Bharucha, Nanabhai R.; and Claessens, Pierre L., 3,941,669.

Clancy, John Mathew; Howard, Rodney William; Wiese, Brian Leslie; Hipsley, Richard Eben; and Kennedy, Christopher Patrick. Apparatus for pulping, slicing and/or destoning vegetables and fruits. 3,941,045, Cl. 99-556.000.

Claridge, Geoffrey Maximilian Lawrence; Driver, Brian Sydney; and Jarvis, Timothy Robert, to U. S. Philips Corporation. Electron collimator. 3,942,019, Cl. 250-512.000.

Clark, Earl Edward: *See—*
Driscoll, James Robert; Clark, Earl Edward; and Haas, Thomas James, 3,941,540.

Clark, Robert T. Basketball game. 3,941,382, Cl. 273-95.00R.

Clarke-Gravely Corporation: *See—*
Phillips, Paul E.; Nise, Wilfred C.; Hommes, Jack L.; and Lowder, Dale E., 3,940,826.

Clarke, Robert William; Hartley, David; and Oxford, Alexander William, to Allen & Hanburys Limited, EN. Imidazo [5,1-f]-as-triazines. 3,941,785, Cl. 260-249.500.

Clarke, William A. Velcro projectile and target. 3,941,383, Cl. 273-95.00R.

Clas, Wilhelm: *See—*
Horstkorte, Helmut; and Clas, Wilhelm, 3,941,737.

Clayton, John Peter; Hardy, Kenneth David; and Guest, Angela Wendy Capel, to Beecham Group Limited. Aminoalkyl esters of penicillins. 3,941,774, Cl. 260-239.100.

Clerk, Robert Cecil. Piston pumps or motors. 3,941,032, Cl. 91-6.500.

Clorox Company, The: *See—*
Fry, Raymond J., 3,941,090.

Clucker, Richard V.; and Kennedy, Roland R., to Harsco Corporation. Method for controlling the packer blade of a refuse truck. 3,941,263, Cl. 214-152.000.

Cluett, Peabody & Co., Inc.: *See—*
Troope, Walter S.; and Lawrence, Jackson, 3,940,833.

Cobb, Donald R., to United States of America, Army. Flechette. 3,941,059, Cl. 102-91.000.

Colby, Harold S.; and Landry, Raymond H., to PCI Group, Inc. Method of installing an insulating sleeve on a staple. 3,940,844, Cl. 29-450.000.

Cole, James B., to Boeing Company, The. Variable camber airfoil. 3,941,334, Cl. 244-42.0CA.

Cole, Judson C.: *See—*
Morain, Eldon W.; and Cole, Judson C., 3,941,145.

Coleman Company, Inc., The: *See—*
Curtis, Richard D., 3,941,554.

Coleman, Lester Earl, to Lubrizol Corporation, The. Cycloaliphatic carboxamides. 3,941,836, Cl. 260-557.00R.

Colgate-Palmolive Company: *See—*
King, William James; Murray, Leo Thomas; and Salzman, Gerhard Martin, 3,941,877.

Collins, Albert V.; and Pearl, Richard E., to Mooney Chemicals, Inc. Metal carboxylate-alkoxy alcoholate composition and process. 3,941,606, Cl. 106-243.000.

Collins, Don E.; and Turner, John F., to United States of America, Air Force. Multipurpose keyboard system. 3,942,175, Cl. 340-365.00R.

Colmey, John C.: *See—*
Ash, David J.; and Colmey, John C., 3,941,895.

Colorguard Corporation: *See—*
Ingraham, Glen E., 3,941,866.

Combaz, Andre F., to Compagnie Francaise des Petroles. Device for the analysis of microscopic objects by laser pyrolysis and chromatography in the gaseous phase. 3,941,567, Cl. 23-253.0PC.

Commissariat a l'Energie Atomique: *See—*
Delisle, Jean-Paul; Pochard, Raymond; Porte, Robert; and Prouteau, Lucien, 3,941,652.
Odru, Rene; and Vacher, Jacques, 3,941,997.

Commonwealth Scientific and Industrial Research Organization: *See—*
Bolto, Brian Alfred, 3,941,724.

Communications Patents Limited: *See—*
Baker, Henry Louis, 3,941,919.

Communications Satellite Corporation (COMSAT): *See—*
Wolejsza, Chester Joseph, Jr., 3,942,115.

Compagnie Francaise des Petroles: *See—*
Combaz, Andre F., 3,941,567.

Compagnie Generale de Radiologie: *See—*
Munch, Joseph, 3,941,368.
Tran-Quang, Dang, 3,942,059.

Compagnie Industrielle des Telecommunications Cit-Alcatel: *See—*
Aillet, Claude, 3,941,929.
Albertin, Michel, 3,941,512.
Franco, Pierre; and Brzozowski, Henri, 3,942,137.
Jacob, Jean-Baptiste; Renoulin, Roger; and Le Drezen, Pierre, 3,941,947.
Rabasse, Jean, 3,941,990.

Compaselect GmbH: *See—*
Haury-Wirtz, Ingeborg Maria; Barensfeld, Lothar Otto; and Callahan, George Edgar, 3,941,167.

Computervision Corporation, The: *See—*
Tyler, Arthur W., 3,941,486.

Conover, Charlotte, executrix: *See—*
Conover, George E., deceased, 3,941,190.

Conover, George E., deceased (by Conover, Charlotte, executrix), to Lynes, Inc. Well control apparatus. 3,941,190, Cl. 166-187.000.

Consolidation Coal Company: *See—*
Reichl, Eric H., 3,941,425.

Construction Engineering Products: *See—*
Franc, Eugene K., 3,941,346.

Constructions Electriques R.V.: *See—*
Simeau, Bernard, 3,942,078.

Consumers Communication Corporation: *See—*
Isaac, Theodore N.; and Ingles, Nancy, 3,941,388.

Consupak, Inc.: *See—*
Pollock, Donald M.; and Hallowell, Fulton W., 3,941,863.

Contal, Maurice, to La Telemecanique Electrique. Contact holder for an electro-magnetic contactor. 3,942,144, Cl. 335-132.000.

Contemporary, Inc.: *See—*
Kanzelberger, James C., 3,940,864.

Continental Can Company, Inc.: *See—*
Patel, Anilkumar U., 3,941,276.
Saumsiegle, Robert W.; and Harry, Ieuan L., 3,941,539.

Continental Industries, Inc.: *See—*
Morain, Eldon W.; and Cole, Judson C., 3,941,145.

Continental Oil Company: *See—*
Jackson, Robert G.; and Starks, Charles M., 3,941,820.

Coons, Harold: *See—*
Fisher, Don H.; Coons, Harold; and Highfill, Jackie, 3,941,260.

Cooper, Herbert. Collapsible living enclosure. 3,941,415, Cl. 296-27.000.

Cooper, Herbert Warren; and deKlerk, John, to Westinghouse Electric Corporation. Broadband microwave bulk acoustic delay device. 3,942,139, Cl. 333-30.00R.

Cope, Geoffrey Wilton, to Dresser Industries, Inc. Truck side frame and bolster connection. 3,941,063, Cl. 105-203.000.

Cornil, Jean-Philippe, to Service National dit: Gaz de France. Supply circuits for fluids under pressure. 3,941,144, Cl. 137-110.000.

Corrales, Mario. Means for introducing and guiding objects into body cavities and blood vessels. 3,941,119, Cl. 128-2.00M.

Costruzioni Aeronautiche Giovanni Agusta S.p.A.: *See—*
Bruel, Andre, 3,941,503.

Cote, Paul T.: *See—*
Blount, Richard; Cote, Paul T.; and Zukowski, Edward C., 3,941,992.

Cottell, Eric Charles. Burning water-in-oil emulsion containing pulverized coal. 3,941,552, Cl. 431-2.000.

Cotterell, Robert Frederick Joseph. Apparatus for moulding heat-expandable thermo-plastics material. 3,941,528, Cl. 425-4.00R.

Couchman, Richard, to Aluminum Company of America. Conically capped extrusion billet. 3,941,570, Cl. 29-187.500.

Couchoud, Paul; and Grimaud, Edouard, to Rhone-Poulenc-Textile. Polyvinylidene fluoride containing threads, fibers and films of good dye affinity, and process for obtaining them. 3,941,860, Cl. 260-900.000.

Cousse, Henri: *See—*
Stenger, M. Antoine; Cousse, Henri; and Mouzin, M. Gilbert, 3,941,878.

Covey, William B.; Mastandrea, John R.; and Teng, Robert N., to McDonnell Douglas Corporation. Projectile recovery system with quick opening valves. 3,940,981, Cl. 73-167.000.

Covrad Limited: *See—*
Deane, Norman Philip, 3,940,966.

CPC International Inc.: *See—*
Heady, Robert E.; and Jacaway, William A., Jr., 3,941,655.

Cragon, Harvey George, to Texas Instruments Incorporated. Read only memory. 3,941,979, Cl. 235-61.11E.

Craig, Alfred C. Jet propulsion engines. 3,940,926, Cl. 60-226.00R.

Crane, Jacob: *See—*
Pryor, Michael J.; Crane, Jacob; Friedman, Sam; and Shapiro, Eugene, 3,941,620.
Shapiro, Eugene; and Crane, Jacob, 3,941,619.

Crane Packing Company: *See—*
Lukes, Donald J., 3,941,394.

Cranston, George Edward; and Moody, Jack Milton, to Cranston Machinery Co., Inc. Water-filled burning table. 3,941,361, Cl. 269-15.000.

Cranston Machinery Co., Inc.: *See*—
Cranston, George Edward; and Moody, Jack Milton, 3,941,361.

Creasey, Norman Geoffrey; and Pike, Leslie Clark, to Imperial Chemical Industries Limited. Surface treating compositions. 3,941,856, Cl. 260-825.000.

Credelca A.G.: *See*—
Gunkel, Dietrich, 3,940,903.

Credner, Hans-Heinrich: *See*—
Pelz, Willibald; Credner, Hans-Heinrich; Schulte, Walter; Klein, Alfons; Wedemeyer, Karlfried; and Nittel, Fritz, 3,941,601.

Creighton, Andrew Malcolm, to National Research Development Corporation. Bis diketopiperazines. 3,941,790, Cl. 260-268.0DK.

Cripe, Robert W. Modular display means. 3,941,247, Cl. 206-511.000.

Cross, Barrington; and Walworth, Bryant Leonidas, to American Cyanamid Company. Novel 3 or 5-aminopyrazolium salts and fungicidal use thereof. 3,941,881, Cl. 424-250.000.

Cross, Thomas R.; and George, Clifford L., to Xerox Corporation. Sheet distributing apparatus. 3,941,369, Cl. 271-64.000.

Croullebois, Georges L. Casing for apparatus provided with a flexible or articulated windable element. 3,941,331, Cl. 242-118.000.

Croup, Robert E., to Acoustic Fiber Sound Systems, Inc. Loudspeaker assembly. 3,941,207, Cl. 181-199.000.

Crown Controls Corporation: *See*—
Stammen, Harold A., 3,941,213.

Crumly, Charles B.; and Lindley, John P., to Itek Corporation. Sweeping spectrum analyzer. 3,942,109, Cl. 324-77.00K.

Crystal Craft Plastics Company, Inc.: *See*—
Izen, Eliott H., 3,941,251.

Csongradmengyei Tanacs Vegyesiparm Szolgaltato Vallalat: *See*—
Ronafoldi, Arnold; and Zoltan, Istvan, 3,941,088.

Cubic Corporation: *See*—
Ciambrone, David F., 3,942,020.

Culkin, Josephine H. Construction toy having stuffed parts of soft materials. 3,940,877, Cl. 46-17.000.

Cunnane, Francis J., III; and Word, Elizabeth L., to Institute of Textile Technology. Electrostatic application of dyestuffs in the dry state. 3,941,559, Cl. 8-2.000.

Cunningham, Paul M., to Spectradyne, Inc. All saturated switching mode solid state RF amplifier. 3,942,117, Cl. 325-161.000.

Curington, Alfred R.; and Roscoe, Theodore J., Jr., to Bakerdrill, Inc. Percussive air hammer and core bit apparatus. 3,941,196, Cl. 175-100.000.

Curn, William J.: *See*—
Riggs, Lawrence H.; and Curn, William J., 3,940,801.

Curtis, Richard D., to Coleman Company, Inc., The. Combination lantern, regulator-valve, and high pressure propane cylinder. 3,941,554, Cl. 431-89.000.

Curtiss-Wright Corporation: *See*—
Roberts, Thomas C., 3,941,098.

Cutler-Hammer, Inc.: *See*—
Piber, Earl T., 3,941,965.
Rauenbuehler, John A., 3,940,850.

Cutting Room Appliances Corporation: *See*—
Feld, Jerome H., 3,941,366.

Czerwiak, Marian A., to American Flange & Manufacturing Co., Inc. Method of manufacturing closure flanges. 3,940,845, Cl. 29-453.000.

d'Acremont, Alain Marie Charles, to Sperry Rand France, S.A. Rotary mower. 3,940,910, Cl. 56-14.400.

D'Agnolo, Armando; and Favero, Giovanni, to Officine Savio, S.p.A. Device for finding, extracting and temporarily positioning the end of the yarn in cops. 3,941,323, Cl. 242-18.00R.

Daimler-Benz Aktiengesellschaft: *See*—
Buchner, Helmut, 3,940,912.
Burckhardt, Manfred H.; Krohn, Hellmut; Grossner, Horst; and Florus, Hans-Jorg, 3,942,036.
Hanke, Hans, 3,941,224.

Dainippon Jochugiku Kabushiki Kaisha: *See*—
Katsuda, Yoshio, 3,940,874.

Dalby, Gaston: *See*—
Ferrara, Peter J.; Dalby, Gaston; Barnes, Clarence A., Jr.; and Gordon, Roy, 3,941,712.

Dalencon, Andre, to Regie Nationale des Usines Renault; and Automobiles Peugeot. Basket for handling machine parts. 3,941,273, Cl. 220-19.000.

Dalziel, Warren L., to Shugart Associates, Inc. Print hammer apparatus with angularly disposed mating hammer and pole faces to prevent contact bounce. 3,941,052, Cl. 101-93.480.

Dammert, Walter: *See*—
Dimroth, Peter; and Dammert, Walter, 3,941,766.

Danfoss A/S: *See*—
Olsen, Carl Ivar, 3,941,033.

Danly Machine Corporation: *See*—
Hagstrom, John M., 3,941,988.
Tack, Carl E., Jr., 3,941,987.

Danneberg, Peter: *See*—
Renth, Ernst-Otto; Mentrup, Anton; Schromm, Kurt; and Danneberg, Peter, 3,941,789.

Danzer, Paul M.; and Rae, Giles E., to United Technologies Corporation. Interferometer radar elevation angle measurement apparatus. 3,942,177, Cl. 343-16.00M.

Daravingas, George V.: *See*—
Hall, Richard C.; Kidd, Norman D.; and Daravingas, George V., 3,941,894.

Darling, Lawrence M. Cutting torch guide. 3,941,358, Cl. 266-23.00E.

Darr, Ralph M.: *See*—
Wetzel, Wilfred W.; and Darr, Ralph M., 3,941,463.

Dascher, Albury John: *See*—
Knollenberg, Robert George; and Dascher, Albury John, 3,941,982.

da Silva Bento, Julio Cesar Santos. Self-loading trailer for tractors. 3,941,264, Cl. 214-390.000.

Davenport Tool Co.: *See*—
Lenker, Paul E.; and Voss, Raymond G., 3,941,017.

Davis, Daniel E.: *See*—
Emerick, Carl D.; and Davis, Daniel E., 3,940,822.

Davis, Jerry P., to Thermo Electron Corporation. Vapor cycle engine having a trifluoroethanol and ammonia working fluid. 3,940,939, Cl. 60-657.000.

Davis, Paul Knight, to Pacific Roller Die Company, Incorporated. Conduit making machine with diameter control and method. 3,940,962, Cl. 72-50.000.

Dawson, Peter Leonard; Rickard, Michael David; and Rothwell, Michael Tom, to Lever Brothers Company. Rinse composition. 3,941,713, Cl. 252-142.000.

Dazen, John R.; and Denero, John V., to Westinghouse Electric Corporation. Nuclear fuel pellet loading machine. 3,940,908, Cl. 53-59.00R.

De Limon Fluhme & Co.: *See*—
Saretzky, Horst, 3,941,210.

Deane, Norman Philip, to Covrad Limited. Apparatus for shaping sheet material. 3,940,966, Cl. 72-196.000.

Deck, Philip E.: *See*—
McCollum, Robert F.; Jones, Robert J.; and Deck, Philip E., 3,941,327.

Deering Milliken Research Corporation: *See*—
Klein, Norman Edward; and Addis, Kenneth James, 3,941,644.
Wethington, Charles A., 3,941,645.

deKlerk, John: *See*—
Cooper, Herbert Warren; and deKlerk, John, 3,942,139.

deLeeuw, Franciscus Hermanus, to U.S. Philips Corporation. Device operating with the displacement of magnetic domain wall. 3,942,165, Cl. 340-174.0TF.

Delin, Heinz; and Rusbuldt, Horst, to H. Maihak AG. Apparatus for indicating the filling level of silos and the like. 3,941,956, Cl. 200-61.200.

Delisle, Jean-Paul; Pochard, Raymond; Porte, Robert; and Prouteau, Lucien, to Commissariat a l'Energie Atomique. Failed fuel detection for nuclear reactor. 3,941,652, Cl. 176-19.0LD.

Delorme, Raymond: *See*—
Chipp, Douglas Frank; and Delorme, Raymond, 3,941,305.

De Martelaere, David L., to Kent-Moore Corporation. Catalytic converter changer device. 3,941,172, Cl. 141-392.000.

Denda, Yasuaki; Kadowaki, Takashi; and Dohi, Michio, to Denki Kagaku Kogyo Kabushiki Kaisha. Non-phasing chloroprene polymer adhesive composition and preparation thereof. 3,941,738, Cl. 260-31.20T.

Denero, John V.: *See*—
Dazen, John R.; and Denero, John V., 3,940,908.

Denino, Edward V.: *See*—
Gribble, Peter R.; and Denino, Edward V., 3,941,315.

Denki Kagaku Kogyo Kabushiki Kaisha: *See*—
Denda, Yasuaki; Kadowaki, Takashi; and Dohi, Michio, 3,941,738.

Depoorter, Henri; and Moelants, Felix Jan, to AGFA-GEVAERT N.V. Fogged, direct-positive silver halide emulsion optically sensitized with a dye containing a pyrrolo[2,1-b]thiazole nucleus. 3,941,602, Cl. 96-101.000.

DePree, David O., to Aerojet-General Corporation. Solid mineral and regenerant recovery for ion-exchange resins. 3,941,693, Cl. 210-34.000.

Deritend Engineering Co. Ltd., The: *See*—
Bishop, Thomas Desmond, 3,941,038.

Dethlefsen, Winfried: *See*—
Broecker, Franz Josef; Zirker, Guenter; Triebskorn, Bruno; Marosi, Laszlo; Schwarzmann, Matthias; Dethlefsen, Winfried; and Kaempfer, Knut, 3,941,721.

Detwiler, Barry C., to Matsushita Electric Industrial Co., Ltd. Method and apparatus for uninterrupted recording and reproduction in a multichannel mode of information on tape. 3,942,190, Cl. 360-63.000.

Deutsche Forschungs-und Versuchsanstalt fur Luft-und Raumfahrt E.V.: *See*—
Schodl, Richard, 3,941,477.

Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See*—
Vollheim, Gerhard; Troger, Karl-Jurgen; and Lippert, Gerhard, 3,941,717.
von Bebenburg, Walter; and Offermanns, Heribert, 3,941,775.

Deutsche Texaco Aktiengesellschaft: *See*—
Pusch, Gunter, 3,941,191.

De Winter, Walter Frans: *See*—
Timmerman, Daniel Maurice; Thijs, Victor Jan; De Winter, Walter Frans; Claes, Frans Henri; and Vandenabeele, Hubert, 3,941,727.

Dexter, Martin; Knell, Martin; and Brunetti, Heimo, to Ciba-Geigy Corporation. Sulfur containing derivatives of dialkyl-4-hydroxyphenyltriazine. 3,941,745, Cl. 260-45.8NT.

De Zuba, George P.; Berger, Abe; and Selin, Terry G., to General Electric Company. Self-bonding, heat-curable silicone rubber. 3,941,741, Cl. 260-37.0SB.

D'Hoogh, Guido Odilon Maurits, to U.S. Philips Corporation. Loudspeaker having a voice coil and a piezoelectric feedback transducer. 3,941,932, Cl. 179-1.00F.

Diamond, Julius; and Santora, Norman Julian, to William H. Rorer, Inc. 2-Thiosulfo biphenylylacetic acids. 3,941,821, Cl. 260-453.00R.

Diamond Tool & Die Company: *See—*
Driscoll, James Robert; Clark, Earl Edward; and Haas, Thomas James, 3,941,540.

Dieling, Hans: *See—*
Schindehutte, Manfred; and Dieling, Hans, 3,941,061.

Diepers, Heinrich; and Schmidt, Otto, to Siemens Aktiengesellschaft. Method for the manufacture of tubular conductors. 3,940,848, Cl. 29-599.000.

Dieringer, Andrew M., to Rexnord, Inc. Method and apparatus for positioning railway machines. 3,942,000, Cl. 250-222.00R.

Diesel Kiki Kabushiki Kaisha: *See—*
Ohki, Seibi, 3,940,949.

Dietrich, Joseph W.; and Lubimov, Eugene J. Apparatus for long term intravenous administration of diluted incompatible multiple medications. 3,941,126, Cl. 128-214.00R.

DiGirolomo, John S.; Giuffre, Marino; Skees, Hugh B.; and Vath, F. Leo, to Standard Register Company, The. Continuous mailer envelope assembly with inserts and method. 3,941,308, Cl. 229-69.000.

Dimmick, George D.; Rhodes, Kevin J.; and Uzumecki, Richard W., to Westinghouse Electric Corporation. Reinforcing ring structure for a shadow mask. 3,942,064, Cl. 313-407.000.

Dimroth, Peter; and Dammert, Walter, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Azo compounds from pigments of a heterocyclic-substituted aniline coupled to a 2,6-dihydroxy-4-methyl-3-cyano or -3-carbamoylpyridine. 3,941,766, Cl. 260-155.000.

Disparte, Charles P.: *See—*
Mock, Howard C.; Isaac, Kenneth N.; Disparte, Charles P.; and Hall, Warren L., 3,942,156.

Dockner, Toni: *See—*
Szymanski, Hans Joachim; and Dockner, Toni, 3,941,844.

Dr. -Ing. H.c.F. Porsche Aktiengesellschaft: *See—*
Schmid, Wolfgang, 3,941,109.

Doe, Ewart H.; and Linforth, William J., to Twyford Moors (Aircraft & Engineering Limited). Bar feeders. 3,941,256, Cl. 214-1.400.

Dohi, Michio: *See—*
Denda, Yasuaki; Kadowaki, Takashi; and Dohi, Michio, 3,941,738.

Dolfini, Joseph Edward: *See—*
Slusarchyk, William A.; Dolfini, Joseph Edward; and Young, Marian G., 3,941,779.

Dolling, William T.; and Kapp, Jack R., to Thiokol Corporation. Flexible bearing having low torque resistance. 3,941,433, Cl. 308-2.00R.

Dorey, Howard Anthony; and Luckhurst, Geoffrey Arthur, to Solartron Electronic Group Limited, The. Bipolar multiple ramp digitisers. 3,942,174, Cl. 340-347.0NT.

Dorn, Clifford G., to United States of America, Navy. Filtered-noise jammer. 3,942,179, Cl. 343-18.00E.

Dornier System GmbH.: *See—*
Huf, Franz, 3,941,524.

Dougherty, Joseph Patrick; Kurtz, Stewart K.; and Seymour, Robert John, to North American Philips Corporation. Second harmonic analyzer. 3,941,478, Cl. 356-30.000.

Dow Chemical Company, The: *See—*
Maskal, John; Thompson, Ivan M.; and Heikel, Henrik R., 3,941,610.

Dow Corning Corporation: *See—*
Bassani, Giovanni, 3,941,169.

Dowa Co., Ltd.: *See—*
Miyahara, Kingo, 3,941,517.

Draber, Wilfried; Regel, Erik; Buchel, Karl-Heinz; Eue, Ludwig; and Schmidt, Robert R., to Bayer Aktiengesellschaft. N-benzyltriazole compounds. 3,941,800, Cl. 260-308.00R.

Drachenberg, Frederick G.; and Allred, Paul E. Method of making soy milk. 3,941,890, Cl. 426-46.000.

Drake, Arvel. Tubular gauze bandage applicator. 3,941,125, Cl. 128-155.000.

Drakes, Russell J., to Wurlitzer Company, The. Electronic coin switch. 3,941,226, Cl. 194-1.00R.

Dravnieks, Konstantins: *See—*
Travaglio, Dalny; Dravnieks, Konstantins; and Sylvester, Gordon C., 3,941,310.

Dremann, Charles Earl, to Foote Mineral Company. Compositions for alloying metal. 3,941,588, Cl. 75-94.000.

Dresser Industries, Inc.: *See—*
Cope, Geoffrey Wilton, 3,941,063.

Dreyfus, Marc G., to BAI Corporation. Non-contact dimensional measurement technique. 3,941,484, Cl. 356-156.000.

Driscoll, James Robert; Clark, Earl Edward; and Haas, Thomas James, to Diamond Tool & Die Company. Sprue bushing for a single cavity or center sprued mold. 3,941,540, Cl. 425-245.0NS.

Driver, Brian Sydney: *See—*
Claridge, Geoffrey Maximilian Lawrence; Driver, Brian Sydney; and Jarvis, Timothy Robert, 3,942,019.

Driver, Michael C.: *See—*
McAvoy, Bruce R.; and Driver, Michael C., 3,942,186.

Drout, Frank G.; and Eyman, Douglas R., to Armstrong Cork Company. Process for forming decorative surface coverings. 3,941,636, Cl. 156-154.000.

Drucker, Howard L. Push toy. 3,940,881, Cl. 46-234.000.

Druminski, Manfred, to Siemens Aktiengesellschaft. Method of producing epitaxially semiconductor layers. 3,941,647, Cl. 156-612.000.

Dual Manufacturing and Engineering Incorporated: *See—*
Re, Frank M., 3,941,417.

Ducellier et Cie: *See—*
Habert, Roger Jean, 3,941,112.

Duckworth, Allen; and Hearn, Richard J., to Chandler Evans Inc. Variable geometry collector for centrifugal pump. 3,941,498, Cl. 415-46.000.

Duden, Emanuel Hubert, to AGFA-GEVAERT N.V. Package for radiographic films. 3,941,246, Cl. 206-455.000.

Dudley, Kenneth W.: *See—*
MacMaster, George H.; and Dudley, Kenneth W., 3,941,968.

Dummermuth, Ernst, to Allen-Bradley Company. Programmable logic controller. 3,942,158, Cl. 340-172.500.

Duncan, Lane. Ball and socket joint and method of making the same. 3,941,495, Cl. 403-267.000.

Duncan, William A.: *See—*
Phillips, John F.; Murfree, James A., Jr.; Wharton, Walter W.; and Duncan, William A., 3,941,626.

Dunlop Australia Limited: *See—*
McDowall, William Leslie, 3,941,615.

Dunlop Limited: *See—*
Okada, Ryozo; Iuchi, Munenori; and Yamada, Munemitsu, 3,941,177.

Dunn, William C., to Semi, Inc. Sense line coupling reduction system. 3,942,164, Cl. 340-173.00R.

Dunwoodie, Duane E.; and Oliver, Wallace, to Wiltron Company. Telephone line testing instrument having a supervising capability. 3,941,950, Cl. 179-175.30R.

Du Pont de Nemours, E. I., and Company: *See—*
Evans, Robert F., 3,941,448.
Friend, Lindsay Carlton, 3,941,442.
Fuchs, Julius Jakob, 3,941,824.
Grot, Walther Gustav, 3,940,916.
Hartig, Martval John, 3,941,546.
Heiart, Robert Bernard, 3,941,596.
Hoh, George Lok Kwong; and Tsukamoto, Akira, 3,941,904.
LeFever, Stanton Brenneman; and Matrisian, Robert Michael, 3,941,969.
Martin, Elmore Louis, 3,941,826.
Saltzman, Robert S., 3,941,563.
Schmidt, Paul Gordon, 3,941,603.
Schwartz, Harold Gordon, 3,941,176.
Solenberger, John Carl, 3,941,728.
Solenberger, John Carl, 3,941,730.
Strachan, Donald Rittler, 3,940,917.
Welsh, Paul Bryce, 3,940,955.
Wu, Souheng, 3,941,857.

Durastone Company: *See—*
Beretta, Angelo V.; and Beretta, David, 3,941,545.

Durham, Donald F.; and McFeeters, Robert D., to Caterpillar Tractor Co. Cup seal for a master brake cylinder. 3,940,938, Cl. 60-588.000.

Durland, Douglas H.: *See—*
Ehret, Robert J.; Stephens, Donald E.; Durland, Douglas H.; and Sharples, Thomas D., 3,941,487.

Durr, Dieter: *See—*
Pissiotas, Georg; and Durr, Dieter, 3,941,829.

Dwyer, Francis G.; and Jenkins, Edwin E., to Mobil Oil Corporation. Crystalline silicates and method of preparing the same. 3,941,871, Cl. 423-326.000.

Dynamit Nobel Aktiengesellschaft: *See—*
Bison, Gunter; Schubel, Hans; and Schmeling, Gerhard, 3,941,814.
Gawlick, Heinz; and Brede, Uwe, 3,941,058.

E. H. Sheldon and Company: *See—*
Carlson, Arthur W., 3,941,040.

E. L. Mustee & Sons, Inc.: *See—*
Mustee, Bernard, 3,940,806.

E. R. Squibb & Sons, Inc.: *See—*
Chen, James Ling, 3,941,133.
Parker, William Lawrence, 3,941,762.
Slusarchyk, William A.; Dolfini, Joseph Edward; and Young, Marian G., 3,941,779.

Eager, George S., Jr.: *See—*
Bahder, George; and Eager, George S., Jr., 3,942,031.

Eastern Company, The: *See—*
Lobello, John; and Allen, George W., 3,941,028.

Eastman Kodak Company: *See—*
Anderson, Albert Edward, Jr., 3,941,816.
Hargrave, Jerry Lee; and Malone, Harold Lee, 3,941,447.

Eaton, John L.; Fagan, John C.; and Eeckhout, Roger V., to SCM Corporation. Steam-spray iron. 3,941,518, Cl. 417-442.000.

Ebara Manufacturing Co., Ltd.: *See—*
Hirayama, Yoshio; and Ito, Kanichi, 3,941,689.

Eckfeldt, Edgar L.; Proctor, William E.; and Eynon, James U., to Leeds & Northrup Company. Cation concentration measurements. 3,941,665, Cl. 324-30.00R.

Ecodyne Corporation: *See*—
Weis, Frank G., 3,941,698.

Edo-Aire Mitchell Industries, Inc.: *See*—
Younkin, James R., 3,940,990.

Edward C. Levy Company: *See*—
Hauser, Karl V.; and Paulsen, Lewis A., 3,941,585.

Edwards, Laroy H., to Chevron Research Company. Piperonyl ethers having juvenile hormone mimetic activity. 3,941,884, Cl. 424-282.000.

Eeckhout, Roger V.: *See*—
Eaton, John L.; Fagan, John C.; and Eeckhout, Roger V., 3,941,518.

Eggleston, David M. Bicycle carrying rack. 3,941,406, Cl. 280-400.000.

Egli, Hans, to Garrett Corporation, The. Multiple turbocharger apparatus and system. 3,941,104, Cl. 123-119.0CB.

Ehlenbeck, Gary J. Pipe clamp. 3,941,494, Cl. 403-188.000.

Ehmann, Wolfgang: *See*—
Olsen, Willi; Lieske, Manfred; Ehmann, Wolfgang; Krause, Dieter; and Perst, Gerhard, 3,942,030.

Ehret, Robert J.; Stephens, Donald E.; Durland, Douglas H.; and Sharples, Thomas D., to Beckman Instruments, Inc. Colorimetric fluid analyzer. 3,941,487, Cl. 356-181.000.

Ehrhard, Fritz, to Bayer Aktiengesellschaft. Shaped polyurethane articles and a method for making them. 3,941,855, Cl. 260-77.5AP.

Ehrhardt, Gerry H.; and Reeves, Ronald L., to Frye Copysystems, Inc. Flow agent for ink systems. 3,941,608, Cl. 106-285.000.

Ehrich, Gustav: *See*—
Bensch, Gotthard; Ehrich, Gustav; and Fendler, Peter, 3,941,100.

Eisen- und Drahtwerk Erlau Aktiengesellschaft: *See*—
Muller, Anton, 3,941,175.

Ekstrom, Alfred; and McLaren, Ashley Brooks, to Australian Atomic Energy Commission. Process for the production of uranium hexafluoride. 3,941,870, Cl. 423-258.000.

El-Trol, Inc.: *See*—
Simpson, John R.; and Lozier, Robert E., Jr., 3,941,178.

Eldorado Tool and Manufacturing Corporation: *See*—
Hjelm, Victor S.; and Rohles, John H., 3,941,364.

Electricity Council, The: *See*—
Simpson, David Preston, 3,942,018.

Eli Lilly and Company: *See*—
O'Doherty, George O. P., 3,941,882.
Wright, Ian G., 3,941,781.

Elitex: *See*—
Kouklik, Ivo, 3,940,953.

Ellin, Seymour, to Polaroid Corporation. Photographic remote slave flash apparatus. 3,942,076, Cl. 317-80.000.

Ellingson, Chester W., Jr., to American Device Manufacturing Company. Panic exit door locking structure. 3,940,886, Cl. 49-319.000.

Elliott, Harry Samuel: *See*—
Togneri, Mauro Guiseppe; and Elliott, Harry Samuel, 3,942,095.

Elmer, Christopher: *See*—
Graham, Keith; Korsky, Viacheslav; Elmer, Christopher; Pinede, Edouard; Litster, John; and Aarts, Jan, 3,941,936.

Emenaker, Leo J.: *See*—
Barrus, Gordon B.; Emenaker, Leo J.; and Melissa, Raymond F., 3,941,051.

Emerick, Carl D.; and Davis, Daniel E., to All Weather Truck Mirror Co., Inc. Rear view safety mirror. 3,940,822, Cl. 15-250.220.

Engelhard Minerals & Chemicals Corporation: *See*—
Byrne, Paul Bradway, 3,942,104.
Godfrey, Loren, 3,941,299.
Pfefferle, William C., 3,940,923.
Puskar, Victor, 3,941,872.

Engerstam, Marten. Brake power controlling device. 3,940,989, Cl. 73-379.000.

Engstrom, John Gordon; and Petaja, Gary Merlin, to Bell Telephone Laboratories, Incorporated. Telephone stand. 3,941,951, Cl. 179-179.000.

Erickson Tool Company: *See*—
Benjamin, Milton L.; and Walker, David D., 3,941,014.

Ernsthausen, Roger E.: *See*—
Byrum, Bernard W., Jr.; and Ernsthausen, Roger E., 3,942,161.

Esec Sales S.A.: *See*—
Nicklaus, Karl, 3,941,298.

Esterline Corporation: *See*—
Bunning, John G., 3,941,290.

Eszakmagyarorszagi Vegyimuvek: *See*—
Grega, Erzsebet; Gribovszky, Pal; Marosvolgyi, Sandor; Pinter, Zoltan; Szilagyi, Gyula; Szita, Istvan; Tarr, Csaba; and Tasi, Laszlo, 3,941,783.

Etat Francais: *See*—
Bellia, Eugene Sauveur, 3,940,840.

Eue, Ludwig: *See*—
Draber, Wilfried; Regel, Erik; Buchel, Karl-Heinz; Eue, Ludwig; and Schmidt, Robert R., 3,941,800.

Evans, Robert F., to Du Pont de Nemours, E. I., and Company. Connector block. 3,941,448, Cl. 339-176.0MF.

Evans, William E. Trolling sinker. 3,940,871, Cl. 43-43.130.

Eve, Clifford F.; and Garbuny, Max, to United States of America, Army. Thermal imaging device. 3,942,008, Cl. 250-332.000.

Everson, Evan Philip, to Walter Kidde & Company, Inc. Programmer clocks for banks and like institutions. 3,940,918, Cl. 58-33.000.

Exxon Research and Engineering Company: *See*—
Kmak, Walter S.; and Yates, David J. C., 3,941,682.
Paynter, John D., 3,941,716.
Vannice, M. Albert; and Garten, Robert Lee, 3,941,819.
Wilson, James A., 3,942,113.

Eyman, Douglas R.: *See*—
Drout, Frank G.; and Eyman, Douglas R., 3,941,636.

Eynon, James U.: *See*—
Eckfeldt, Edgar L.; Proctor, William E.; and Eynon, James U., 3,941,665.

F. D. Farnum Co.: *See*—
Farnam, Robert G.; and Passarella, Michael T., 3,941,640.

Fabricacion de Maquinas: *See*—
Martin, John; and Osorio, Enrique Peyrani, 3,941,370.
Martin, John K., 3,941,371.

Fader, Marshall Lloyd; and Schick, Lloyd Alan, to Miles Laboratories, Inc. Method for assessing thyroid function. 3,941,564, Cl. 23-230.00B.

Fagan, John C.: *See*—
Eaton, John L.; Fagan, John C.; and Eeckhout, Roger V., 3,941,518.

Fain, Charles C.: *See*—
Swedenberg, Clyde J.; Fain, Charles C.; and Rutledge, William W., 3,941,632.

Fairchild Camera and Instrument Corporation: *See*—
Sirocka, Richard L.; and Broxterman, David F., 3,942,043.

Fanger, Hans-Ulrich: *See*—
Apenberg, Walter; Bohme, Georg; Fanger, Hans-Ulrich; Glaser, Benno; Hain, Klaus; Hubener, Jorg; Stegmaier, Winfried; Prech, Vaclav; and Vagner, Jaroslav, 3,942,003.

Farmer Bros. Co.: *See*—
Wells, Daniel M.; and Tarrant, James H., 3,941,042.

Farnam, Robert G.; and Passarella, Michael T., to F. D. Farnum Co. Method of producing a high temperature gasket structure. 3,941,640, Cl. 156-252.000.

Farr, Glyn Philip Reginald, to Girling Limited. Hydraulic control valve assemblies. 3,941,155, Cl. 137-627.500.

Fastner, Thorwald, to Vereinigte Osterreichische Eisen- und Stahlwerk-Alpine Montan Aktiengesellschaft. Method of determining the suitability of continuously cast slabs of Al- or Al-Si-killed soft steel for producing cold rolled sheets to be tinned. 3,940,976, Cl. 73-104.000.

Favero, Giovanni: *See*—
D'Agnolo, Armando; and Favero, Giovanni, 3,941,323.

Federal Paper Board Company, Inc.: *See*—
Ganz, Robert H., 3,940,907.

Feld, Jerome H., to Cutting Room Appliances Corporation. Cloth laying carriage for one way operation having cloth clamping cutting box. 3,941,366, Cl. 270-31.000.

Fendler, Peter: *See*—
Bensch, Gotthard; Ehrich, Gustav; and Fendler, Peter, 3,941,100.

Fenne, Ivor, to C.A.V. Limited. Hydraulic system. 3,941,282, Cl. 222-76.000.

Fennessy, Donald W.; and Schmitz, Harry W., to General Electric Company. Apparatus for manufacturing semiconductor devices. 3,941,532, Cl. 425-117.000.

Ferguson, Myron E., to California Microwave, Inc. Transceiver having improved voice actuated carrier and echo suppression circuit. 3,942,116, Cl. 325-22.000.

Ferranti, Limited: *See*—
Krebs, Peter Eric; and Walters, Frank, 3,942,071.

Ferrara, Peter J.; Dalby, Gaston; Barnes, Clarence A., Jr.; and Gordon, Roy. Soap composition and process of producing such. 3,941,712, Cl. 252-126.000.

Ferraris Development and Engineering Company Limited: *See*—
Oram, John Anderson, 3,940,984.

Ferrin, Frank J., to Honeywell Inc. Target identification apparatus. 3,941,483, Cl. 356-152.000.

Fiat Societa per Azioni: *See*—
Palazzetti, Mario, 3,942,045.

Figge, Erwin E.; Hapke, Kenyon A.; Karalus, George C.; and Lenell, Robert C., to Bell & Howell Company. Film handling apparatus control system. 3,941,465, Cl. 352-130.000.

Figura, Zdeno, to Vyskumny ustav mechanizacia a automatizacie. Torsion vibrator of a supersonic viscosimeter. 3,942,052, Cl. 310-26.000.

Fima, Raoul. Internally mounted battery jump cables. 3,942,027, Cl. 307-10.00R.

Fine, Ira W.: *See*—
Newman, Irvin; and Kelly, Michael G., 3,941,975.

Finke, Manfred: *See*—
Kleiner, Hans-Jerg; Finke, Manfred; Bollert, Ulrich; and Herwig, Walter, 3,941,752.

Finley, Joseph H., to FMC Corporation. Dextrin carboxylates and their use as detergent builders. 3,941,771, Cl. 260-233.500.

Fire Fighting Enterprises Limited: *See*—
Hamilton, Ian Robert; and Alley, David Murray Underwood, 3,941,095.

Firestone Tire & Rubber Company, The: *See*—
Barbin, William W.; and Sanda, Joseph C., Jr., 3,941,740.

Firmenich SA: *See*—
Buchi, George Hermann, 3,941,828.

Fisher, Don H.; Coons, Harold; and Highfill, Jackie, to ISCO Manufacturing Company, Inc. Material carrying vehicle. 3,941,260, Cl. 214-82.000.

Fjieda, Kazumasa: *See—*
Tajima, Shigeru; Shimamura, Takeshi; Matsumoto, Kojiro; Sekiguchi, Sadao; Yamagoshi, Tanoshi; and Fjieda, Kazumasa, 3,941,912.
Flachenecker, Gerhard: *See—*
Meinke, Hans Heinrich; Lindenmeier, Heinz; Landstorfer, Fritz; and Flachenecker, Gerhard, 3,942,119.
Flaugnatti, Richard Bruno. Radiological protective screen. 3,942,023, Cl. 250-515.000.
Flax, Valer. Bottle capsules. 3,941,269, Cl. 215-246.000.
Flesburg, Edward E., to Caterpillar Tractor Co. Filter bypass indicator. 3,941,958, Cl. 200-82.00R.
Fleshman, Roger L. Egg layer system. 3,941,091, Cl. 119-18.000.
Flora, John H.: *See—*
Weis, Edmund B., Jr.; Hassler, Craig R.; and Flora, John H., 3,940,803.
Florus, Hans-Jorg: *See—*
Burckhardt, Manfred H.; Krohn, Hellmut; Grossner, Horst; and Florus, Hans-Jorg, 3,942,036.
Fluhr, Frederick R.; Hanley, Stephen T.; and Brown, R. Bernard, to United States of America, Navy. Aspheric cassegrain laser power amplifier system. 3,942,127, Cl. 330-4.300.
Fluid Systems Research, Inc.: *See—*
Gillilan, James E.; and Townsend, Henry M., 3,941,509.
FMC Corporation: *See—*
Finley, Joseph H., 3,941,771.
Leckband, Lee M.; and Taatjes, Steven W., 3,940,906.
Orlando, Franklin P.; and Hendriks, Johan, 3,941,047.
Food Technology, Inc.: *See—*
Glabe, Elmer F.; Anderson, Perry W.; Laftsidis, Stergios; and Grothus, Philip G., 3,941,893.
Foote Mineral Company: *See—*
Dremann, Charles Earl, 3,941,588.
Ford Motor Company: *See—*
Allison, William D., 3,941,401.
Camelon, Melville J.; and Gibeau, Rodney C., 3,941,731.
Ford, Patricia M. Game position monitoring device. 3,941,080, Cl. 116-130.000.
Forenade Fabriksverken: *See—*
Nystrom, Per Henrik Gosta, 3,940,933.
Forry, Mark E.: *See—*
Kletecka, George; and Forry, Mark E., 3,941,843.
Fort, Jean-Francois; and Giraudon, Raymond, to Rhone Poulenc S.A. 5-Alkyl-3-(2-hydroxylamino-4-chlorophenyl)-1,3,4-oxadiazolin-2-one compounds. 3,941,798, Cl. 260-307.00A.
Fosroc A.G.: *See—*
Barrow, John Samuel; Radcliffe, Allen; and Taylor, Donald, 3,941,917.
Foulletier, Louis; and Bertocchio, Rene, to Produits Chimiques Ugine Kuhlmann. Fire extinguishing compositions containing fluorinated surfactants. 3,941,705, Cl. 252-8.050.
Fowler, Albert Lewis, to Hughes Microelectronics Limited. Signal combining circuits. 3,942,002, Cl. 250-231.00R.
Foxboro Company, The: *See—*
Richardson, David A.; and Robinson, Robert J., 3,940,935.
Franc, Eugene K., to Construction Engineering Products. Tie rod assembly including resilient sealing and spacing means. 3,941,346, Cl. 249-40.000.
Franchi, Luigi: *See—*
Busatto, Vinicio; and Franchi, Luigi, 3,941,599.
Francis, John F., to Gillette Company, The. Shaving unit with blade tensioning means. 3,940,853, Cl. 30-346.580.
Franco, Pierre; and Brzozowski, Henri, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Device for the remote adjustment of an inaccessible element. 3,942,137, Cl. 333-16.000.
Francois, Gilbert: *See—*
Libert, Andre; and Francois, Gilbert, 3,940,941.
Franz, Maurice F.: *See—*
Webber, Philip S.; and Franz, Maurice F., 3,941,007.
Franz, Raymond A.; Madding, Gary D.; and Li, Tao P., to Monsanto Company. Method for producing styrene and benzene. 3,941,854, Cl. 260-669.00R.
Frazar, Joseph H., to General Electric Company. Condenser apparatus. 3,940,861, Cl. 34-75.000.
Frei, Jorg: *See—*
Ilvespaa, Atso; Gagneux, Andre; Schweizer, Ernst; and Frei, Jorg, 3,941,804.
Freter, John Maher: *See—*
Benton, Cecil Thomas; Freter, John Maher; and Moore, Robert R., 3,940,804.
Freygang, Hans-Joachim; and Kovacs, Gabor, to Siemens Aktiengesellschaft. Measuring transformer with a capacitor bushing. 3,942,099, Cl. 323-44.00R.
Frezza, Robert, to Samcoe Holding Corporation. Apparatus for fabric web treatment. 3,941,326, Cl. 242-56.00R.
Fricke, Gunther: *See—*
Singewald, Arno; and Fricke, Gunther, 3,941,685.
Fried. Krupp Gesellschaft mit beschrankter Haftung: *See—*
Hennes, Heinrich; and Sommer, Walter, 3,940,968.
Hoffmeister, Bernhard; and Schwarz, Wilhelm, 3,941,259.
Friedline, Ernest J.; and Mitchell, Robert N., to Kennametal Inc. Slotting cutter and cutting insert therefor. 3,940,835, Cl. 29-105.00R.
Friedman, Sam: *See—*
Pryor, Michael J.; Crane, Jacob; Friedman, Sam; and Shapiro, Eugene, 3,941,620.
Friedrich Uhde GmbH: *See—*
Strasser, Bernd; Kramer, Wolfgang; Mose, Luciano; and Hund, Helmut, 3,941,675.
Von Semel, Georg; Schibilla, Eduard; and Strewe, Wolfgang, 3,941,667.
Friend, Lindsay Carlton, to Du Pont de Nemours, E. I., and Company. Daughter board contact. 3,941,442, Cl. 339-17.00M.
Fritz, Thomas W., to Armstrong Cork Company. Fluorescent light for mobile homes. 3,941,995, Cl. 240-51.11R.
Froning, Edward C. Apparatus and method for stereotaxic lateral extradural disc puncture. 3,941,127, Cl. 128-215.000.
Frost, Lawrence W., to Westinghouse Electric Corporation. Linear oxadiazole-imide copolymers. 3,941,749, Cl. 260-65.000.
Frost, Scott Octave: *See—*
Horky, Reginald Patrick; and Frost, Scott Octave, 3,941,638.
Fry, Raymond J., to Clorox Company, The. Cedar-based animal litter. 3,941,090, Cl. 119-1.000.
Frye Copysystems, Inc.: *See—*
Ehrhardt, Gerry H.; and Reeves, Ronald L., 3,941,608.
Frymoyer, Willard W. Support and manipulation table for spinal examination and experimentation. 3,941,365, Cl. 269-325.000.
Fuchs, Hugo; Gath, Rudolph; Kahr, Kurt; and Kartte, Klaus, to BASF Aktiengesellschaft. Partial dehydration of cyclohexanone oxime. 3,941,838, Cl. 260-566.00A.
Fuchs, Julius Jakob, to Du Pont de Nemours, E. I., and Company. Herbicidal carbamates and thiolcarbamates. 3,941,824, Cl. 260-455.00A.
Fuchs, Warren. Process for exothermic reactions. 3,941,869, Cl. 423-239.000.
Fuhrmeister, William F.: *See—*
Balko, Jack E.; Blair, John E.; Bybee, Jerry L.; Fuhrmeister, William F.; and Kushmaul, Richard T., 3,942,153.
Fuji Kasui Engineering Co., Ltd.: *See—*
Uchiyama, Hisashi; Meno, Naohiko; Senjo, Teizo; and Kobayashi, Makio, 3,941,572.
Fuji Xerox Co., Ltd.: *See—*
Sadamatsu, Shigeru; and Nozaki, Toll, 3,941,898.
Fujii, Shigeru: *See—*
Wakabayashi, Hiroshi; Nakagawa, Toru; Matsumura, Shoichi; and Fujii, Shigeru, 3,941,757.
Fujimoto, Yoshiji; Kadota, Shozo; Yasuda, Michio; Hayashi, Shinichi; and Hananoi, Toshihiro, to Hitachi, Ltd. Pattern recognition system. 3,942,169, Cl. 340-146.3AE.
Fujita, Kazutoshi: *See—*
Uehara, Kenichiro; Ito, Atsuo; Nishimune, Koichi; and Fujita, Kazutoshi, 3,942,017.
Fukuda, Masaaki: *See—*
Mohri, Katsuo; Fukuda, Masaaki; Kayano, Tatsuo; and Yoshino, Takehiko, 3,941,920.
Fukui, Akio: *See—*
Koike, Hiroshi; Fukui, Akio; Ito, Yuji; Tanaka, Takehiko; and Okuda, Yukio, 3,941,815.
Fukumaru, Takafumi: *See—*
Yosioka, Takayuki; Komada, Tadashi; Sugano, Akira; and Fukumaru, Takafumi, 3,942,088.
Fukushima, Masayoshi: *See—*
Nonaka, Kohei; Fukushima, Masayoshi; and Sakai, Kunio, 3,940,999.
Fukushima, Yoshio: *See—*
Abe, Takeshi; and Fukushima, Yoshio, 3,941,981.
Fukuyama, Yoshinobu, to Takatori Machinery Works, Ltd. Automatic method and apparatus for closing the toe of seamless hose. 3,941,069, Cl. 112-262.000.
Furuhata, Takashi: *See—*
Yumde, Yasufumi; and Furuhata, Takashi, 3,941,921.
Furukawa Electric Co., Ltd., The: *See—*
Oishi, Masanori; Koyanagi, Harusige; and Matsumoto, Kazuo, 3,941,914.
G. D. Searle & Co.: *See—*
Short, George E., 3,941,880.
Sollman, Paul B., 3,941,831.
Whitehead, Frank R., 3,941,479.
GAF Corporation: *See—*
Barabas, Eugene S.; and Grosser, Frederick, 3,941,718.
Chakrabarti, Paritosh Mohan, 3,941,817.
Gagneux, Andre: *See—*
Allgeier, Hans; and Gagneux, Andre, 3,941,799.
Ilvespaa, Atso; Gagneux, Andre; Schweizer, Ernst; and Frei, Jorg, 3,941,804.
Gaind, Jagjit R., to Zenith Radio Corporation. Corona-free high voltage connector. 3,941,928, Cl. 178-7.800.
Gall, Martin, to Upjohn Company, The. 2-(Imidazol-1-yl)benzophenones. 3,941,802, Cl. 260-309.000.
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Ganz, Robert H., to Federal Paper Board Company, Inc. Bottle packaging machine. 3,940,907, Cl. 53-48.000.
Garbe, Siegfried, to Nilodor Company, Inc., The. Timed drop applicator. 3,941,283, Cl. 222-187.000.
Garbuny, Max: *See—*
Eve, Clifford F.; and Garbuny, Max, 3,942,008.
Gardiner, William J., III; and Aymami, Arthur L., to Gates Rubber Company, The. Power transmission belt. 3,941,005, Cl. 74-233.000.
Gardner, Lloyd E.: *See—*
Norell, John R.; and Gardner, Lloyd E., 3,940,972.

Garlock Inc.: *See—*
Bainard, Dean R., 3,941,393.
Garrett Corporation, The: *See—*
Egli, Hans, 3,941,104.
Garrison, Harold Keith; Case, Cecil L.; and White, Allen A., to Hesston Corporation. Balanced sickle drive. 3,941,003, Cl. 74-44.000.
Garte, Gilbert M. Method of and apparatus for extracting oil from oil shale. 3,941,423, Cl. 299-8.000.
Garten, Robert Lee: *See—*
Vannice, M. Albert; and Garten, Robert Lee, 3,941,819.
Gaschenko, Viktor Petrovich: *See—*
Konstantinov, Alexei Kirillovich; Volkov, Vladimir Vasilievich; Gaschenko, Viktor Petrovich; Lukashkov, Igor Vladimirovich; Klitsov, Alexandr Abramovich; and Kuzmenko, Valentin Timofeevich, 3,940,813.
Gates Rubber Company, The: *See—*
Gardiner, William J., III; and Aymami, Arthur L., 3,941,005.
Kesinger, Donald A., 3,940,936.
Gath, Rudolph: *See—*
Fuchs, Hugo; Gath, Rudolph; Kahr, Kurt; and Kartte, Klaus, 3,941,838.
Gauthier, John A., to GTE Automatic Electric (Canada) Limited. Dial pulse receiver. 3,941,937, Cl. 179-18.0EB.
Gauthier, John A., to GTE Automatic Electric (Canada) Limited. Time shared TCMF and MF decoder. 3,941,938, Cl. 179-18.0EB.
Gawlick, Heinz; and Brede, Uwe, to Dynamit Nobel Aktiengesellschaft. Electric ignition device. 3,941,058, Cl. 102-70.2GA.
Gehring, Adolph J., Jr., to General Electric Company. Brush holder and rigging assembly for a dynamoelectric machine. 3,942,056, Cl. 310-241.000.
Gelenkwellenbau GmbH: *See—*
Schultenkamper, Josef, 3,940,948.
Gelsing, Richardus Johannes Henricus; and van Steensel, Kees, to U.S Philips Corporation. Semiconductor device with multi-layered metal interconnections. 3,942,187, Cl. 357-71.000.
Gendron, Wilfred H., to United States Envelope Company. Combined brochure and return envelope package. 3,941,309, Cl. 229-73.000.
General Battery Corporation: *See—*
Nees, John M., 3,941,617.
General Cable Corporation: *See—*
Bahder, George; and Eager, George S., Jr., 3,942,031.
General Dynamics Corporation: *See—*
Slysh, Paul, 3,940,891.
General Electric Company: *See—*
Allison, Ralph H., Jr., 3,941,000.
Anderson, Robert M.; and Sobieski, John C., 3,941,555.
Blount, Richard; Cote, Paul T.; and Zukowski, Edward C., 3,941,992.
Cawood, George H., 3,942,067.
De Zuba, George P.; Berger, Abe; and Selin, Terry G., 3,941,741
Fennessy, Donald W.; and Schmitz, Harry W., 3,941,532.
Frazar, Joseph H., 3,940,861.
Gehring, Adolph J., Jr., 3,942,056.
Graham, Daniel J., 3,942,074.
Hoffmeyer, William R., 3,942,055.
Kennedy, Richard W.; and Tefft, Edward G., 3,941,625.
Lapidot, Heine, 3,940,993.
McCarty, William J., 3,941,339.
Milkovic, Miran, 3,942,110.
Smith, William E., 3,941,851.
General Foods Corporation: *See—*
Glasser, George Marvin; and Matos, Herbert, 3,941,892.
General Instrument Corporation: *See—*
La Belle, Robert, 3,942,146.
General Motors Corporation: *See—*
Blom, Hubert Peter, 3,941,419.
Bourbeau, Frank J.; Meredith, Barton L.; and Witten, Arthur L., 3,942,092.
Choly, Mitchell, 3,941,064.
Jaffe, James M., 3,941,629.
Kutkus, Leonardas, 3,941,526.
Pozniak, Donald J.; and Siewert, Robert M., 3,940,928.
Robinson, Donovan L., 3,941,015.
Rockwell, Lynn A., 3,941,107.
Rothwell, Jack L.; and Warren, Williams S., 3,941,428.
General Signal Corporation: *See—*
Andersen, George L., 3,940,946.
General Tire & Rubber Company, The: *See—*
Herold, Robert Johnston, 3,941,849.
Gentit, William F.; and Marolewski, Theodore A., to Stauffer Chemical Company. Hydraulic fluid antioxidant system. 3,941,708, Cl. 252-78.000.
Georg Fischer Aktiengesellschaft: *See—*
Riester, Hans, 3,941,868.
Georg Muller Kugellager-Fabrik KG: *See—*
Hack, Eugen, 3,941,353.
George, Clifford L.: *See—*
Cross, Thomas R.; and George, Clifford L., 3,941,369.
Georgi, Heinz W., to IVAC Corporation. Electronic measurement system. 3,942,123, Cl. 328-1.000.
Gerber Electronic Lock, Inc.: *See—*
Gerber, Richard W., 3,941,955.
Gerber, Oskar; and Agmen, Karl Gosta, to Granges Nyby AB. Method and means for controlling the air pressure in a sound-proofed hangar for testing jet engines. 3,941,205, Cl. 181-33.0HB.
Gerber, Richard W., to Gerber Electronic Lock, Inc. Electric lock and key assembly. 3,941,955, Cl. 200-44.000.
Gerber Scientific Instrument Company, The: *See—*
Webster, Ronald B.; Carulli, Vincent J.; and Wood, Kenneth O., 3,941,480.
Gerhard, Allen Robert, to Western Electric Company, Inc. Method and apparatus employing thin conductive films on flexible nonconductive sheets for non-destructive measurement of electrical characteristics. 3,942,107, Cl. 324-57.00Q.
Gerresheimer Glas Aktiengesellschaft: *See—*
Haddenhorst, Gunter, 3,941,031.
Gesellschaft fur Kernforschung m.b.H.: *See—*
Apenberg, Walter; Bohme, Georg; Fanger, Hans-Ulrich; Glaser, Benno; Hain, Klaus; Hubener, Jorg; Stegmaier, Winfried; Prech, Vaclav; and Vagner, Jaroslav, 3,942,003.
Getz, Edward J.: *See—*
Barbieri, Thomas; Getz, Edward J.; and Wilson, Alfred W., 3,941,304.
Getzin, Allan R., to American Air Filter Company, Inc. Filter pleat fold spacer. 3,941,571, Cl. 55-500.000.
Gibeau, Rodney C.: *See—*
Camelon, Melville J.; and Gibeau, Rodney C., 3,941,731.
Gibson, Harry S., Jr.; and Rogers, Stephen C., Jr., to Lockheed Aircraft Corporation. Fastener system for structural members. 3,941,027, Cl. 85-1.00R.
Gilbert, Allan H.; and Kinsman, Donald V., to Lever Brothers Company. Phosphate - free dishwashing compositions containing an alkyl polyether carboxylate surfactant. 3,941,710, Cl. 252-99.000.
Gilbert, Everett E., to United States of America, Army. Thermally stable octanitro macrocyclic explosives. 3,941,812, Cl. 260-338.000.
Gilbert, Gerald M.: *See—*
Chappell, Peter; Hicks, Burnette W.; and Gilbert, Gerald M., 3,941,984.
Gillespie, John Francis, to Saguaro Industries, Inc. Apparatus for making synthetic resin carpeting and the like. 3,941,533, Cl. 425-143.000.
Gillette Company, The: *See—*
Francis, John F., 3,940,853.
Gillilan, James E.; and Townsend, Henry M., to Fluid Systems Research, Inc. Pumping system. 3,941,509, Cl. 417-54.000.
Gillilan, Robert L.: *See—*
Pullukat, Thomas J.; Shida, Mitsuzo; and Gillilan, Robert L., 3,941,761.
Gilvar, Martin, to Morgan Construction Company. Apparatus for cooling hot rolled steel rod by forced air convection or by supplying heat. 3,940,961, Cl. 72-40.000.
Gioia, Charles J.; and Gioia, Mario. Paint tray and container apparatus. 3,940,824, Cl. 15-257.060.
Gioia, Mario: *See—*
Gioia, Charles J.; and Gioia, Mario, 3,940,824.
Giordano, Anthony J. Cut-out locations marking method, means, and method of forming said means. 3,940,857, Cl. 33-189.000.
Giordano, Jean Louis; and Guettier, Michel, to Regie Nationale des Usines Renault; and Automobiles Peugeot. Inertia and load responsive device for limiting braking pressure. 3,941,431, Cl. 303-24.00A.
Gipson, Robert Malone, to Jefferson Chemical Company, Inc. Novel combination soap bar. 3,941,711, Cl. 252-117.000.
Giraudon, Raymond: *See—*
Fort, Jean-Francois; and Giraudon, Raymond, 3,941,798.
Girling Limited: *See—*
Farr, Glyn Philip Reginald, 3,941,155.
Harries, David Anthony, 3,941,427.
Harrison, Anthony William, 3,941,220.
Kaub, Manfred, 3,941,217.
Newstead, Charles, 3,941,222.
Gist-Brocades N.V.: *See—*
Lameris, Sophia Adriana; van Os, Jan Lambert; and Oostendorp, Joannes Gerard, 3,941,658.
Giuffre, Marino: *See—*
DiGirolomo, John S.; Giuffre, Marino; Skees, Hugh B.; and Vath, F. Leo, 3,941,308.
Glabe, Elmer F.; Anderson, Perry W.; Laftsidis, Stergios; and Grothus, Philip G., to Food Technology, Inc. Agglomeration process. 3,941,893, Cl. 426-285.000.
Glaser, Benno: *See—*
Apenberg, Walter; Bohme, Georg; Fanger, Hans-Ulrich; Glaser, Benno; Hain, Klaus; Hubener, Jorg; Stegmaier, Winfried; Prech, Vaclav; and Vagner, Jaroslav, 3,942,003.
Glasmachers, Gisbert: *See—*
Borner, Manfred; Glasmachers, Gisbert; Bernecker, Otto; Riemann, Volker; and Maslowski, Stefan, 3,941,945.
Glass, Marvin I.; Katzman, Allison; and Aleksa, Peter. Walking doll. 3,940,879, Cl. 46-102.000.
Glass Master Corporation: *See—*
Williams, Jimmy L., 3,941,018.
Glasser, George Marvin; and Matos, Herbert, to General Foods Corporation. Low-cholesterol egg product and process. 3,941,892, Cl. 426-104.000.
Glenn, Robert G., to Westinghouse Electric Corporation. Turbomachine interstage seal assembly. 3,941,500, Cl. 415-136.000.
Glindmeyer, Friedrich; Hennenberg, Wilhelm Friedrich; and Limpens, Karl, to William Prym-Werke KG. Method of making a woven zipper. 3,941,163, Cl. 139-384.00B.

Gloxhuber, Christian: *See—*
Ploger, Walter; Schmidt-Dunker, Manfred; and Gloxhuber, Christian, 3,941,772.

Godfrey, Loren, to Engelhard Minerals & Chemicals Corporation. Method of brazing Cu alloys to Ag-Cdo alloys. 3,941,299, Cl. 228-219.000.

Goffe, William L., to Xerox Corporation. Manual assist document feeder. 3,941,473, Cl. 355-75.000.

Gognaco, Jean-Claude, to Societe Anonyme dite: HEXACHIMIE. Amino derivatives of 2,2-diaryl-cyclopropane. 3,941,833, Cl. 260-472.000.

Gold, Elijah H., to Schering Corporation. Compositions useful for treating parkinsonism. 3,941,885, Cl. 424-305.000.

Golden M Enterprises, Inc.: *See—*
McDonald, Maxwell Wilson, 3,941,134.

Goltsos, Costas E., to Teckton, Inc. Electrical appliance for heating foods and food package therefor. 3,941,044, Cl. 99-391.000.

Gordon, Roger G., to Safe Rack, Inc. Coin box mechanism. 3,941,227, Cl. 194-1.00K.

Gordon, Roy: *See—*
Ferrara, Peter J.; Dalby, Gaston; Barnes, Clarence A., Jr.; and Gordon, Roy, 3,941,712.

Gotham, Stanley Thomas: *See—*
Bradbury, Christopher Grover; Gotham, Stanley Thomas; and Wudyka, Joseph Paul, 3,941,684.

Goto, Kuniaki; and Sakashita, Tatsuo, to Nippon Zeon Co., Ltd. Functional liquid. 3,941,706, Cl. 252-59.000.

Goto, Naohiro: *See—*
Tanaka, Yasuo; Yamamoto, Hideaki; Ooki, Keiko; Goto, Naohiro; and Takigawa, Toru, 3,941,672.

Gould, Francis E.: *See—*
Shepherd, Thomas H.; and Gould, Francis E., 3,941,858.

Gower, Gordon Shields, to Nabalco Engineering Pty. Limited. Submarine pipelines. 3,940,942, Cl. 61-72.300.

Goyal, Deepak K., to Burroughs Corporation. CCD stack memory organization. 3,942,163, Cl. 340-173.00R.

Graham, Daniel J., to General Electric Company. Static overcurrent relay. 3,942,074, Cl. 317-36.0TD.

Graham, Keith; Korsky, Viacheslav; Elmer, Christopher; Pinede, Edouard; Litster, John; and Aarts, Jan, to International Standard Electric Corporation. Telecommunication system using TDM switching. 3,941,936, Cl. 179-15.0AT.

Graham Magnetics Incorporated: *See—*
Newton, Gerald S., 3,941,911.

Graham, William J., to Texaco Inc. Ball type valve with high pressure sealing capability. 3,941,351, Cl. 251-161.000.

Granges Nyby AB: *See—*
Gerber, Oskar; and Agmen, Karl Gosta, 3,941,205.

Graser, Fritz, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Mass coloration of polyamides. 3,941,742, Cl. 260-37.0NP.

Graubremse GmbH: *See—*
Blanz, Roland, 3,941,432.

Gray, Oscar Sam. Process and equipment for treating seeds and product thereof. 3,940,885, Cl. 47-58.000.

Greco, Salvatore T. Leaf vacuuming attachment for rotary lawn mowers. 3,940,827, Cl. 15-328.000.

Green Cross Corporation, The: *See—*
Sako, Eiji; and Sasamoto, Hisasi, 3,940,802.

Green, Jesse: *See—*
Hunyar, Csaba K.; and Green, Jesse, 3,941,547.

Green, John Hugh: *See—*
Holmes, Phillip L.; Cinkus, Frank; and Green, John Hugh, 3,941,939.

Green, Lane A., to Superior Iron Works & Supply Company, Inc. Cable stringing apparatus. 3,941,324, Cl. 242-54.00R.

Green, Sam J.; and Raeske, Frank J., to Champion Spark Plug Company. Apparatus for measuring the temperature of an operating spark plug. 3,940,987, Cl. 73-346.000.

Green, William F.: *See—*
Tasker, Homer G.; and Green, William F., 3,940,980.

Greenberger, Joseph Irwin, to Wean United, Inc. Apparatus for cooling strip like material. 3,941,611, Cl. 134-64.00R.

Greene, Leonard M., to Safe Flight Instrument Corporation. Faraday effect fluid flow and direction indicator. 3,940,983, Cl. 73-181.000.

Greeson, Logan C., to Hi Bridger, Inc. Mobil load raising structure. 3,941,267, Cl. 214-730.000.

Grega, Erzsebet; Gribovszky, Pal; Marosvolgyi, Sandor; Pinter, Zoltan; Szilagyi, Gyula; Szita, Istvan; Tarr, Csaba; and Tasi, Laszlo, to Eszakmagyarorszagi Vegyimuvek. Process for the production of N,N-disubstituted carboxylic amides. 3,941,783, Cl. 260-247.70V.

Grenon, Lawrence A., to Motorola, Inc. Scannable light emitting diode array and method. 3,940,846, Cl. 29-577.000.

Greth, Erich, to Lonza Ltd. Process for the production of 4-hydroxy-6-hydroxymethylpyrimidine. 3,941,786, Cl. 260-251.00R.

Gribble, Peter R.; and Denino, Edward V., to SCM Corporation. Process for production of powder paints. 3,941,315, Cl. 241-3.000.

Gribovszky, Pal: *See—*
Grega, Erzsebet; Gribovszky, Pal; Marosvolgyi, Sandor; Pinter, Zoltan; Szilagyi, Gyula; Szita, Istvan; Tarr, Csaba; and Tasi, Laszlo, 3,941,783.

Griebsch, Eugen: *See—*
Brinkmann, Bernd; and Griebsch, Eugen, 3,941,753.

Grimaud, Edouard: *See—*
Couchoud, Paul; and Grimaud, Edouard, 3,941,860.

Grolet, Pierre: *See—*
Chatard, Michel; Grolet, Pierre; Reynard, Remi; and Thiery, Jean, 3,941,146.

Grosemans, Jozef-Antoon; vander Lely, Piet; and Stigter, Willem Hendrik, to U.S. Philips Corporation. Record player. 3,941,392, Cl. 274-10.00R.

Grosser, Frederick: *See—*
Barabas, Eugene S.; and Grosser, Frederick, 3,941,718.

Grossner, Horst: *See—*
Burckhardt, Manfred H.; Krohn, Hellmut; Grossner, Horst; and Florus, Hans-Jorg, 3,942,036.

Grot, Walther Gustav, to Du Pont de Nemours, E. I., and Company. Knitted or woven ion exchange fabric containing low denier filaments. 3,940,916, Cl. 57-140.00R.

Grothus, Philip G.: *See—*
Glabe, Elmer F.; Anderson, Perry W.; Laftsidis, Stergios; and Grothus, Philip G., 3,941,893.

Grow, Arthur Larry, to Precision Tool & Machine Co. Feed roll and method of imparting a rough texture to the surface thereof. 3,941,970, Cl. 219-69.00R.

Grunert, Hellmuth; and Vitt, Theodor, to Prameta Prazisionsmetall -und Kunststofferzeugnisse G. Baumann & Co. Parallel rod furniture hinge. 3,940,829, Cl. 16-163.000.

Grunleitner, Johann: *See—*
Liska, Manfred; and Grunleitner, Johann, 3,942,081.

Grunsten, Michael H., to GTE Automatic Electric Laboratories Incorporated. Axial sorting device. 3,941,249, Cl. 209-104.000.

Grutter, Walter; and Kapper, Gerhard. Apparatus for controlling lubrication of compressed air tools. 3,941,211, Cl. 184-56.00A.

Gryctko, Carl E., to I-T-E Imperial Corporation. Crimping tool for cable connector. 3,940,838, Cl. 29-203.0DT.

Gschwend, Heinz Werner; and Hillman, Malvin J., to Ciba-Geigy Corporation. Aromatic dicarboxamides as anticonvulsants. 3,941,883, Cl. 424-274.000.

GTE Automatic Electric (Canada) Limited: *See—*
Gauthier, John A., 3,941,937.
Gauthier, John A., 3,941,938.

GTE Automatic Electric Laboratories Incorporated: *See—*
Grunsten, Michael H., 3,941,249.
Horiuchi, Edward M.; and Souto Martins, Jose V., 3,942,125.
Miller, Howard R.; Putchinski, Leo J., Jr.; and Vanderlei, Kenneth W., 3,941,949.
Neese, Wayne E., 3,941,575.
Reimer, William A., 3,941,443.

GTE Laboratories Incorporated: *See—*
Haugsjaa, Paul Osborne; Nelson, William F.; Regan, Robert James; and McNeill, William Henry, 3,942,058.
Haugsjaa, Paul Osborne; McNeill, William Henry; Regan, Robert James; and Lech, Joseph Martin, 3,942,068.

GTE New Ventures Corporation: *See—*
Marinkovich, Vincent A., 3,941,876.

GTE Sylvania Incorporated: *See—*
Mathers, James E.; Yale, Ramon L.; and Layman, H. David, 3,941,714.

Guest, Angela Wendy Capel: *See—*
Clayton, John Peter; Hardy, Kenneth David; and Guest, Angela Wendy Capel, 3,941,774.

Guettier, Michel: *See—*
Giordano, Jean Louis; and Guettier, Michel, 3,941,431.

Guhl, Richard E.: *See—*
Renfro, Kenneth W.; and Guhl, Richard E., 3,940,931.

Guimond, Charles W. Spinner game device. 3,941,389, Cl. 273-142.0HA.

Gulf Oil Corporation: *See—*
Roth, Clarence Edward, Jr.; Lasswell, Joseph Arnold; Bybee, William Dennis; and Parker, Earl Brewer, Jr., 3,941,747.

Gulf Research & Development Company: *See—*
Beuther, Harold; Chun, Sun W.; and Montagna, Angelo A., 3,941,683.
Bryson, Millard C.; Murphy, Harry C., Jr.; Murphy, James R.; and Stauffer, Harry C., 3,941,680.

Gulf & Western Manufacturing Company: *See—*
Wolf, Siegfried G., 3,941,255.

Gundlach, Robert W., to Xerox Corporation. Apparatus for controlling developer efficiency. 3,941,280, Cl. 222-52.000.

Gunkel, Dietrich, to Credelca A.G. Prefabricated transportable room element for use in the construction of a plural storey building. 3,940,903, Cl. 52-745.000.

Gunttner, Rudiger. Barometer gas pressure measuring apparatus. 3,940,991, Cl. 73-393.000.

Gurkov, Konstantin Stepanovich: *See—*
Kostylev, Alexandr Dmitrievich; Gurkov, Konstantin Stepanovich; Tupitsyn, Konstantin Konstantinovich; and Kreimer, Vladimir Isaakovich, 3,941,101.

Guthling, Klaus: *See—*
Semmler, Eduard O.; Guthling, Klaus; and Meyer, Adolf J. G., 3,941,055.

Gutnick, David; and Rosenberg, Eugene. Cleaning of cargo compartments. 3,941,692, Cl. 210-11.000.

H. Maihak AG: *See—*
Delin, Heinz; and Rusbuldt, Horst, 3,941,956.

H. P. Bus Corporation of America: *See—*
Ricci, William S., 3,941,261.

Haas, Thomas James: *See—*
Driscoll, James Robert; Clark, Earl Edward; and Haas, Thomas James, 3,941,540.

Haass, Adolf, to Siemens Aktiengesellschaft. Apparatus for generating ungrounded voltages. 3,942,098, Cl. 323-23.000.

Habert, Roger Jean, to Ducellier et Cie. Ignition device for internal combustion engines. 3,941,112, Cl. 123-148.00E.

Hack, Eugen, to Georg Muller Kugellager-Fabrik KG. Device for releasably holding a movable body. 3,941,353, Cl. 254-124.000.

Hackett, Kenneth R., to Sontrix, Inc. Intrusion detection system. 3,942,178, Cl. 343-5.0PD.

Haddenhorst, Gunter, to Gerresheimer Glas Aktiengesellschaft. Pneumatic controller for controlling the operation of an automatic machine. 3,941,031, Cl. 91-6.000.

Hadnagy, Thomas D. Multi-line chemical injection system. 3,942,082, Cl. 318-51.000.

Hagedorn, Hans. Infeed apparatus for carton loading machines. 3,941,236, Cl. 198-29.000.

Hagemann, Hermann, to Bayer Aktiengesellschaft. Process for the preparation of carbonyl diisocyanate. 3,941,873, Cl. 423-365.000.

Hagstrom, John M., to Danly Machine Corporation. Method and apparatus for numerical control. 3,941,988, Cl. 235-151.110.

Hain, Klaus: *See—*
Apenberg, Walter; Bohme, Georg; Fanger, Hans-Ulrich; Glaser, Benno; Hain, Klaus; Hubener, Jorg; Stegmaier, Winfried; Prech, Vaclav; and Vagner, Jaroslav, 3,942,003.

Hakansson, Sven Anders Samuel, to Kommanditbolaget United Stirling (Sweden) AB & Co. Stirling engines. 3,940,934, Cl. 60-525.000.

Hall, James Robert, to RCA Corporation. Controlled gain amplifier. 3,942,129, Cl. 330-29.000.

Hall, Richard C.; Kidd, Norman D.; and Daravingas, George V., to SCM Corporation. Composition for reducing pickle bloating. 3,941,894, Cl. 426-532.000.

Hall, Warren L.: *See—*
Mock, Howard C.; Isaac, Kenneth N.; Disparte, Charles P.; and Hall, Warren L., 3,942,156.

Hallowell, Fulton W.: *See—*
Pollock, Donald M.; and Hallowell, Fulton W., 3,941,863.

Halter, Edmund John, to Burgess Industries Incorporated. Noise attenuating snubber. 3,941,206, Cl. 181-50.000.

Ham, Ronald E., to Texas Instruments Incorporated. SWD FM receiver circuit. 3,942,120, Cl. 325-344.000.

Hamada, Kuniaki: *See—*
Kawase, Katsuyuki; Sato, Mutumi; Hamada, Kuniaki; and Hayashi, Seiji, 3,941,985.

Hamalainen, Veikko; and Aarnio, Jaakko. Vaporizing apparatus for liquids. 3,941,861, Cl. 261-19.000.

Hamilton, Ian Robert; and Alley, David Murray Underwood, to Fire Fighting Enterprises Limited. Animal handling apparatus. 3,941,095, Cl. 119-103.000.

Hamy, Norbert, to Trebron Holdings Limited. Transportation system. 3,941,239, Cl. 198-184.000.

Hanada, Hiroshi; Kitajima, Nobuo; and Masaki, Tatsuo, to Canon Kabushiki Kaisha. Electrophotographic photoconductive member employing a chalcogen alloy and a crystallization inhibiting element. 3,941,591, Cl. 96-1.500.

Hananoi, Toshihiro: *See—*
Fujimoto, Yoshiji; Kadota, Shozo; Yasuda, Michio; Hayashi, Shinichi; and Hananoi, Toshihiro, 3,942,169.

Hanke, Hans, to Daimler-Benz Aktiengesellschaft. Continuous hydrodynamic brake for motor vehicles, especially heavy commercial vehicles. 3,941,224, Cl. 192-13.00A.

Hankovszky, Olga; Hideg, Kalman; and Pacsa, Sandor, to Richter Gedeon Vegyeszeti Gyar Rt. Benzimidazole derivatives. 3,941,788, Cl. 260-256.40F.

Hanley, Stephen T.: *See—*
Fluhr, Frederick R.; Hanley, Stephen T.; and Brown, R. Bernard, 3,942,127.

Hannan, William James: *See—*
Lawson, Robert Crawford; Porter, David; and Hannan, William James, 3,942,013.

Hans Kolbe & Co.: *See—*
Meinke, Hans Heinrich; Lindenmeier, Heinz; Landstorfer, Fritz; and Flachenecker, Gerhard, 3,942,119.

Hapke, Kenyon A.: *See—*
Figge, Erwin E.; Hapke, Kenyon A.; Karalus, George C.; and Lenell, Robert C., 3,941,465.

Haraszti, Tegze P.; and Snuggs, Wiley Preston, to Texas Instruments Incorporated. Scanning system for digital-analog converter. 3,942,171, Cl. 340-347.0DA.

Hardmark, Ragnar Malcus; and Kornbrink, Hans Folke Georg, to Saab-Scania Aktiebolay. Flexible shaft. 3,940,945, Cl. 64-2.00R.

Hardy, Kenneth David: *See—*
Clayton, John Peter; Hardy, Kenneth David; and Guest, Angela Wendy Capel, 3,941,774.

Hargrave, Jerry Lee; and Malone, Harold Lee, to Eastman Kodak Company. Camera flash socket. 3,941,447, Cl. 339-91.00R.

Harp, Robert S., to Hughes Aircraft Company. Coax-to-radial transition. 3,942,130, Cl. 330-34.000.

Harreld, Albert F.: *See—*
Petty, Preston L.; Harreld, Albert F.; and Scott, Gary M., 3,941,994.

Harries, David Anthony, to Girling Limited. Anti-skid braking system for vehicles. 3,941,427, Cl. 303-21.0AF.

Harrington, John Herbert: *See—*
Tundermann, John Hayes; and Harrington, John Herbert, 3,941,584.

Harris, Louis Selig; Pars, Harry George; Razdan, Raj Kumar; and Sheehan, John Clark, to Sharps Associates. Heterocyclic esters of benzopyrans. 3,941,782, Cl. 260-243.00B.

Harris, Rano J., Jr.: *See—*
Harris, Rano J., Sr.; and Harris, Rano J., Jr., 3,940,995.

Harris, Rano J., Sr.; and Harris, Rano J., Jr. Automatic fluid injector. 3,940,995, Cl. 73-422.0GC.

Harris-Thomas Drop Forge Company, The: *See—*
Princehouse, Joseph B., 3,940,969.

Harris, W. Leslie. Zero energy input flocculator. 3,941,695, Cl. 210-49.000.

Harris, William D.: *See—*
Best, Robert H.; and Harris, William D., 3,942,072.

Harrison, Anthony William, to Girling Limited. Railway brakes. 3,941,220, Cl. 188-196.0BA.

Harry, Ieuan L.: *See—*
Saumsiegle, Robert W.; and Harry, Ieuan L., 3,941,539.

Harsch, Thomas B., to Hoffmann-La Roche Inc. Surface alignment method for liquid crystal cells and production of polarizers therefor. 3,941,901, Cl. 427-108.000.

Harsco Corporation: *See—*
Clucker, Richard V.; and Kennedy, Roland R., 3,941,263.

Hartig, Gunter. Method and apparatus for changing the spark advance of internal combustion engines. 3,941,103, Cl. 123-117.00R.

Hartig, Martval John, to Du Pont de Nemours, E. I., and Company. Apparatus and process. 3,941,546, Cl. 425-387.00R.

Hartley, David: *See—*
Clarke, Robert William; Hartley, David; and Oxford, Alexander William, 3,941,785.

Hartwig, Karl: *See—*
Schatka, Gunther; Kruger, Wilm; Paulus, Rudolf; Koleff, Boris; Pattis, Erich; and Hartwig, Karl, 3,941,471.

Harvey, Edgar L., to Burroughs Corporation. Gaseous discharge type display panel for displaying large number of characters. 3,942,060, Cl. 313-188.000.

Hashimoto, Masao: *See—*
Asano, Shiro; Yoshimura, Kiyotaka; and Hashimoto, Masao, 3,941,837.

Hashimoto, Naoto; Kuritani, Masaaki; and Toukai, Noriaki, to Takeda Chemical Industries, Ltd. Method for producing isonitrosomalonic esters. 3,941,823, Cl. 260-455.00R.

Hassler, Craig R.: *See—*
Weis, Edmund B., Jr.; Hassler, Craig R.; and Flora, John H., 3,940,803.

Hata, Yoshitaka: *See—*
Takao, Hiroshi; Togawa, Kinmochi; Matoba, Kazuo; and Hata, Yoshitaka, 3,941,673.

Hattler, Louis R.; and Bar-on, Ari, to Xerox Corporation. Release material applicator. 3,941,085, Cl. 118-60.000.

Haugsjaa, Paul Osborne; Nelson, William F.; Regan, Robert James; and McNeill, William Henry, to GTE Laboratories Incorporated. Electrodeless light source having improved arc shaping capability. 3,942,058, Cl. 313-44.000.

Haugsjaa, Paul Osborne; McNeill, William Henry; Regan, Robert James; and Lech, Joseph Martin, to GTE Laboratories Incorporated. Electrodeless light source with a termination fixture having an improved center conductor for arc shaping capability. 3,942,068, Cl. 315-39.000.

Haury-Wirtz, Ingeborg Maria; Barensfeld, Lothar Otto; and Callahan, George Edgar, to Compaselect GmbH. Admixture and process for the production of solutions for infusions. 3,941,167, Cl. 141-1.00R.

Hauser, Karl V.; and Paulsen, Lewis A., to Edward C. Levy Company. Process for cooling slag and inhibiting pollutant formation. 3,941,585, Cl. 75-24.000.

Havens, Allan R. Bale loading and stacking apparatus. 3,941,266, Cl. 214-518.000.

Hayami, Heijiro: *See—*
Tsuchiya, Hiroyoshi; Yoshida, Kunio; Tsuda, Yukifumi; Hayami, Heijiro; and Kotera, Hiroaki, 3,941,922.

Hayashi, Seiji: *See—*
Kawase, Katsuyuki; Sato, Mutumi; Hamada, Kuniaki; and Hayashi, Seiji, 3,941,985.

Hayashi, Shinichi: *See—*
Fujimoto, Yoshiji; Kadota, Shozo; Yasuda, Michio; Hayashi, Shinichi; and Hananoi, Toshihiro, 3,942,169.

Hayes-Albion Corporation: *See—*
Christiansen, Paul, 3,940,951.

Hayne, Thomas F., to Xerox Corporation. Corona generator cleaning apparatus. 3,942,006, Cl. 250-326.000.

Hayworth, Leil W. Pallet jig and table. 3,941,291, Cl. 227-152.000.

Hazenbosch, Edwin Hendrik: *See—*
Van Goethem, Hugo Vital; Hazenbosch, Edwin Hendrik; and Poot, Albert Lucien, 3,941,598.

Heady, Robert E.; and Jacaway, William A., Jr., to CPC International Inc. Method for recovering xylose isomerase. 3,941,655, Cl. 195-31.00F.

Healy, James C.: *See—*
Batiuk, Martin; Herman, Richard M.; and Healy, James C., 3,941,859.

Hearn, Richard J.: *See—*
Duckworth, Allen; and Hearn, Richard J., 3,941,498.

Hedlund, Harland R.; and Wethe, Harry K., to Aladdin Manufacturing Company. Method for sharpening rotary blades. 3,940,889, Cl. 51-288.000.

Heiart, Robert Bernard, to Du Pont de Nemours, E. I., and Company. Thermographic processes using polymer layer capable of existing in metastable state. 3,941,596, Cl. 156-234.000.

Heikel, Henrik R.: *See—*
Maskal, John; Thompson, Ivan M.; and Heikel, Henrik R., 3,941,610.

Heimbrand, Eberhard; and Bok, Peter, to Ledermann & Co. Apparatus for machining the edges of panels, especially panels of wood material having hard glue layers thereon. 3,941,173, Cl. 144-114.00R.

Hell, Renate Elisabeth; and Scheuermann, Horst, to BASF Aktiengesellschaft. Compounds of the naphthalimide series. 3,941,791, Cl. 260-281.00Q.

Heller, William C., Jr.; and Leatherman, Alfred F., to Heller, William C., Jr. Bonding method and apparatus. 3,941,641, Cl. 156-272.000.

Helwig, Carl; and Helwig, Dolores F. Filter attachment for automobile passenger compartment air intake. 3,941,034, Cl. 98-2.110.

Helwig, Dolores F.: *See—*
Helwig, Carl; and Helwig, Dolores F., 3,941,034.

Henderson, John Keller. Method of interconnecting wells for solution mining. 3,941,422, Cl. 299-4.000.

Hendriks, Johan: *See—*
Orlando, Franklin P.; and Hendriks, Johan, 3,941,047.

Henkel & Cie G.m.b.H.: *See—*
Horstkorte, Helmut; and Clas, Wilhelm, 3,941,737.
Klement, Gunter; Baumann, Horst; and Scheidt, Eugen, 3,941,907.
Ploger, Walter; Schmidt-Dunker, Manfred; and Gloxhuber, Christian, 3,941,772.

Hennenberg, Wilhelm Friedrich: *See—*
Glindmeyer, Friedrich; Hennenberg, Wilhelm Friedrich; and Limpens, Karl, 3,941,163.

Hennes, Heinrich; and Sommer, Walter, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Device for making hollow bodies. 3,940,968, Cl. 72-349.000.

Henning, Erik E. Heat accumulator. 3,941,185, Cl. 165-4.000.

Henrichon, Ernest G., Jr.: *See—*
La White, Eric L.; Henrichon, Ernest G., Jr.; and Bloom, Harvey J., 3,941,375.

Hensarling, Thomas P.; Jacks, Thomas J.; and Yatsu, Lawrence Y., to United States of America, Agriculture. Use of acidic hexane to process oil seeds for protein and oil. 3,941,764, Cl. 260-123.500.

Hensley, J. Carl: *See—*
Petry, Chester H., Jr.; and Hensley, J. Carl, 3,941,646.

Herbeck, Rudolf; Kolk, Erich; Schweier, Guenther; Schick, Hans; and Urban, Friedrich, to BASF Aktiengesellschaft. Manufacture of particulate homopolymers or copolymers of ethylene. 3,941,760, Cl. 260-94.90C.

Herber, John F.; Richard, William R., Jr.; and Street, Robert W., to Monsanto Company. Functional fluid compositions containing epoxide stabilizers. 3,941,709, Cl. 252-78.000.

Hercules Incorporated: *See—*
Aldrich, Paul Harwood, 3,941,736.
Breslow, David S., 3,941,751.
Peterson, Albert H.; and Peterson, Howard L., 3,941,057.

Herman, Richard M.: *See—*
Batiuk, Martin; Herman, Richard M.; and Healy, James C., 3,941,859.

Hermann, Gunther; Hoffmann, Peter; Rosendahl, Friedrich-Karl; and Ugi, Ivar, to Bayer Aktiengesellschaft. Dithiobiuret derivatives used for repelling birds, rodents, leporine animals and ruminants. 3,941,887, Cl. 424-322.000.

Hermann, Walter; and Kraus, Peter, to Messerschmitt-Bolkow-Blohm GmbH. Traffic merging method and means. 3,941,201, Cl. 180-98.000.

Hermstein, Wolfgang; and Schiemann, Heinz, to Siemens Aktiengesellschaft. Voltage transformer for use in high voltage switching installation. 3,942,106, Cl. 323-44.00R.

Hernqvist, Karl Gerhard, to RCA Corporation. Metal vapor laser discharge device. 3,942,062, Cl. 313-220.000.

Herold, Robert Johnston, to General Tire & Rubber Company, The. Polyethers and method for making the same. 3,941,849, Cl. 260-607.00A.

Herwig, Walter: *See—*
Kleiner, Hans-Jerg; Finke, Manfred; Bollert, Ulrich; and Herwig, Walter, 3,941,752.

Hesston Corporation: *See—*
Garrison, Harold Keith; Case, Cecil L.; and White, Allen A., 3,941,003.

Hewitt, Arthur Raymond, to Platt Saco Lowell Limited. Textile yarn processing. 3,941,322, Cl. 242-18.00R.

Hewlett-Packard Company: *See—*
Misson, William W.; Studley, Clarence K.; West, William J.; and Liljenwall, Edward T., 3,941,953.

Heyer Inc.: *See—*
Springer, Edward M., 3,941,054.

Heynisch, Hinrich; and Veith, Werner, to Siemens Aktiengesellschaft. Time multiplex electron beam with modulating means. 3,942,136, Cl. 332-21.000.

Hi Bridger, Inc.: *See—*
Greeson, Logan C., 3,941,267.

Hicks, Burnette W.: *See—*
Chappell, Peter; Hicks, Burnette W.; and Gilbert, Gerald M., 3,941,984.

Hicks, Donnie H.: *See—*
Robertson, Harry H.; Hicks, Donnie H.; and Hofmann, Hugh M., 3,941,347.

Hideg, Kalman: *See—*
Hankovszky, Olga; Hideg, Kalman; and Pacsa, Sandor, 3,941,788.

Hieber, Otto: *See—*
Schuhbauer, Albert; and Hieber, Otto, 3,941,607.

Higashida, Susumu: *See—*
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Toda, Toshimasa; Mori, Eiko; Horiuchi, Hideo; Higashida, Susumu; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohata, Noriyuki; and Ohsawa, Hisayou, 3,941,744.

Highfill, Jackie: *See—*
Fisher, Don H.; Coons, Harold; and Highfill, Jackie, 3,941,260.

Hildebrandt, Karl H. Clarinet key mechanism. 3,941,026, Cl. 84-382.000.

Hill, James E., to Imperial Manufacturing Company. Quick foot release for swim fin. 3,940,815, Cl. 9-309.000.

Hiller, Trueman W.; and Jarr, Klaus D., to Weil-McLain Company, Inc. Liquid dispensing and vapor recovery system utilizing an injector and a vapor flow control valve. 3,941,168, Cl. 141-46.000.

Hillman, Malvin J.: *See—*
Gschwend, Heinz Werner; and Hillman, Malvin J., 3,941,883.

Hind, Robert Duncan, to United States Steel Corporation. Control device for regulating teeming rate. 3,941,281, Cl. 222-56.000.

Hinze, Franklin E.: *See—*
Anderson, Edward J.; and Hinze, Franklin E., 3,940,959.

Hipsley, Richard Eben: *See—*
Clancy, John Mathew; Howard, Rodney William; Wiese, Brian Leslie; Hipsley, Richard Eben; and Kennedy, Christopher Patrick, 3,941,045.

Hirabayashi, Teruhiko: *See—*
Tsuruta, Hidemasa; Hiwatashi, Yukinori; Hirabayashi, Teruhiko; and Kumata, Seiji, 3,941,875.

Hirayama, Yoshio; and Ito, Kanichi, to Ebara Manufacturing Co., Ltd. Apparatus for sorting waste for disposal. 3,941,689, Cl. 209-296.000.

Hiromae, Yoshitaka: *See—*
Asano, Hidejiro; and Hiromae, Yoshitaka, 3,941,910.

Hironaka, Melvin C., to United States of America, Navy. Subbottom rock mapping probe. 3,940,982, Cl. 73-170.00A.

Hiruma, Mituo, to Nissan Motor Co., Ltd. Hydro-pneumatic suspension unit. 3,941,403, Cl. 280-124.00F.

Hirwe, Asha: *See—*
Metcalf, Robert L.; Kapoor, Inder; and Hirwe, Asha, 3,941,842.

Hishitani, Kinue. Device for cleaning moving balustrade belt. 3,941,241, Cl. 198-230.000.

Hitachi Electronics Co., Ltd.: *See—*
Mohri, Katsuo; Fukuda, Masaaki; Kayano, Tatsuo; and Yoshino, Takehiko, 3,941,920.

Hitachi, Ltd.: *See—*
Fujimoto, Yoshiji; Kadota, Shozo; Yasuda, Michio; Hayashi, Shinichi; and Hananoi, Toshihiro, 3,942,169.
Mohri, Katsuo; Fukuda, Masaaki; Kayano, Tatsuo; and Yoshino, Takehiko, 3,941,920.
Mohri, Katsuo; Watatani, Yoshizumi; Nabeyama, Hiroaki; and Yoshino, Takehiko, 3,941,930.
Moriyama, Hiromi; Kuwabara, Motosuke; Jin, Katsuyuki; and Tsuruda, Tadao, 3,941,952.
Okamoto, Keiichi; Matsumoto, Yoshio; and Oshima, Yasujiro, 3,941,980.
Okuhara, Shinzi, 3,942,040.
Sasaki, Kouji; Nakano, Seizo; and Tsubaki, Tohru, 3,941,963.
Seki, Kunio; and Kontani, Ryozo, 3,942,128.
Takahashi, Tadashi; and Onishi, Kazuo, 3,942,083.
Tanaka, Yasuo; Yamamoto, Hideaki; Ooki, Keiko; Goto, Naohiro; and Takigawa, Toru, 3,941,672.
Tanifuji, Shinya; Morooka, Yasuo; and Tanuma, Masaya, 3,940,960.
Tomura, Teruichi; Akatsuka, Mitsuo; and Iyama, Hiroyuki, 3,942,070.
Watanabe, Tadao, 3,942,005.
Yosioka, Takayuki; Komada, Tadashi; Sugano, Akira; and Fukumaru, Takafumi, 3,942,088.
Yumde, Yasufumi; and Furuhata, Takashi, 3,941,921.

Hitachi Metals, Ltd.: *See—*
Watanabe, Rikizo, 3,941,590.

Hiwatashi, Yukinori: *See—*
Tsuruta, Hidemasa; Hiwatashi, Yukinori; Hirabayashi, Teruhiko; and Kumata, Seiji, 3,941,875.

Hjelm, Victor S.; and Rohles, John H., to Eldorado Tool and Manufacturing Corporation. Adjustable shaft rest assembly. 3,941,364, Cl. 269-156.000.

Hoechst Aktiengesellschaft: *See—*
Kleiner, Hans-Jerg; Finke, Manfred; Bollert, Ulrich; and Herwig, Walter, 3,941,752.
Mitzlaff, Michael; and Schnabel, Horst, 3,941,666.

Hoffmann, Karl H.; and Anderson, Donald R., to Nalco Chemical Company. Method of producing a raney copper catalyst and the catalyst so made. 3,941,720, Cl. 252-463.000.

Hoffmann-La Roche Inc.: *See—*
Harsch, Thomas B., 3,941,901.
Surmatis, Joseph Donald; and Walser, Armin, 3,941,841.
Wehrli, Pius Anton, 3,941,852.

Hoffmann, Peter: *See—*
Hermann, Gunther; Hoffmann, Peter; Rosendahl, Friedrich-Karl; and Ugi, Ivar, 3,941,887.

Hoffmeister, Bernhard; and Schwarz, Wilhelm, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Device for relocating fuel elements and control rods in a core reactor. 3,941,259, Cl. 214-27.000.

Hoffmeyer, William R., to General Electric Company. Hermetic motor stator. 3,942,055, Cl. 310-216.000.

Hofmann, Hugh M.: *See*—
Robertson, Harry H.; Hicks, Donnie H.; and Hofmann, Hugh M., 3,941,347.

Hoh, George Lok Kwong; and Tsukamoto, Akira, to Du Pont de Nemours, E. I., and Company. Method of applying adhesive coatings using segmented copolyester compositions. 3,941,904, Cl. 427-207.000.

Hohenschutz, Heinz: *See*—
Kummer, Rudolf; Nienburg, Hans-Juergen; Hohenschutz, Heinz; Strohmeyer, Max; and Teutsch, Theo, 3,941,848.

Hokama, Takeo, to Velsicol Chemical Corporation. Herbicidal compositions. 3,941,580, Cl. 71-107.000.

Hollingshad, William Robert, to Calgon Corporation. Corrosion inhibition. 3,941,562, Cl. 21-2.70R.

Holmer, Donald A.: *See*—
Chapman, Richard D.; Holmer, Donald A.; Pickett, Oscar A., Jr.; and Saunders, James H., 3,941,755.

Holmes, Phillip L.; Cinkus, Frank; and Green, John Hugh, to International Telephone and Telegraph Corporation. Electronic ring trip circuit. 3,941,939, Cl. 179-18.0HB.

Holst, Preben Lindholm: *See*—
Madsen, Hans Berg; Holst, Preben Lindholm; and Solli, Houk, 3,941,777.

Holzer, Wilhelm: *See*—
Pollmann, Fritz; and Holzer, Wilhelm, 3,942,143.

Hommes, Jack L.: *See*—
Phillips, Paul E.; Nise, Wilfred C.; Hommes, Jack L.; and Lowder, Dale E., 3,940,826.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Yagi, Shizuo; and Asaka, Urataro, 3,941,105.

Honeywell Inc.: *See*—
Ferrin, Frank J., 3,941,483.
Hutch, Frederick S., 3,942,038.
Koch, Robert B.; and Skogen, John D., 3,941,659.
Stauffer, Norman L., 3,941,476.
Stauffer, Norman L., 3,941,996.

Honjo, Satoru; and Miyatuka, Hajime, to Rank Xerox Ltd. Electrophotographic element with ZnO and TiO_2. 3,941,594, Cl. 96-1.800.

Hooker Chemicals & Plastics Corporation: *See*—
Maul, James J.; and Carlson, Richard D., 3,941,758.

Horiike, Yoshio: *See*—
Nakamura, Shoichi; Inui, Toshiaki; and Horiike, Yoshio, 3,940,920.

Horiuchi, Edward M.; and Souto Martins, Jose V., to GTE Automatic Electric Laboratories Incorporated. Digital repetition rate check circuit. 3,942,125, Cl. 328-141.000.

Horiuchi, Hideo: *See*—
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Toda, Toshimasa; Mori, Eiko; Horiuchi, Hideo; Higashida, Susumu; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohata, Noriyuki; and Ohsawa, Hisayou, 3,941,744.

Horky, Reginald Patrick; and Frost, Scott Octave. Manufactured relief-sculptured sound grills (used for covering the sound producing side and/or front of most manufactured sound speaker enclosures) and the manufacturing process for the said grills. 3,941,638, Cl. 156-196.000.

Hornman, Johannes Petrus: *See*—
van Esdonk, Johannes; and Hornman, Johannes Petrus, 3,942,061.

Horstkorte, Helmut; and Clas, Wilhelm, to Henkel & Cie G.m.b.H. PVC plastisols containing inorganic peroxides. 3,941,737, Cl. 260-30.60R.

Hosmer/Dorrance Corporation: *See*—
Benton, Cecil Thomas; Freter, John Maher; and Moore, Robert R., 3,940,804.

Hotsenpiller, John R.: *See*—
Busch, Albert E.; and Hotsenpiller, John R., 3,941,925.

Houlihan, William J.; and Nadelson, Jeffrey, to Sandoz, Inc. Substituted or unsubstituted p-alkanoyl toluenes as hypolipidemics. 3,941,888, Cl. 424-331.000.

Howard, Rodney William: *See*—
Clancy, John Mathew; Howard, Rodney William; Wiese, Brian Leslie; Hipsley, Richard Eben; and Kennedy, Christopher Patrick, 3,941,045.

Howell, LeRoy H., to Stratford Squire International, Magic Mill. Safety release handle apparatus. 3,941,010, Cl. 74-545.000.

Hoya Glass Works, Ltd.: *See*—
Yamashita, Toshiharu, 3,941,605.

Hoya Lens Co., Ltd.: *See*—
Yamashita, Toshiharu, 3,941,605.

Hubele, Adolf, to Ciba-Geigy AG. Oxime ethers and pesticidal preparations containing them. 3,941,832, Cl. 260-471.00R.

Hubele, Adolf, to Ciba-Geigy AG. Oxime ethers and pesticidal preparations containing them. 3,941,839, Cl. 260-566.0AE.

Hubener, Jorg: *See*—
Apenberg, Walter; Bohme, Georg; Fanger, Hans-Ulrich; Glaser, Benno; Hain, Klaus; Hubener, Jorg; Stegmaier, Winfried; Prech, Vaclav; and Vagner, Jaroslav, 3,942,003.

Hubert, Jean, to C G R Alexandre. Illuminating device in particular for an operating table. 3,941,993, Cl. 240-1.400.

Hudson, Frederick W., to Xerox Corporation. Apparatus and method for measuring angle of repose. 3,940,997, Cl. 73-432.00R.

Hudson Oxygen Therapy Sales Company: *See*—
Price, John H.; and Ruksenas, Miguel A., 3,941,862.

Huf, Franz, to Dornier System GmbH. Rotary piston engine having a trochoidal piston and annularly-closed axial seals in the piston. 3,941,524, Cl. 418-99.000.

Hughes Aircraft Company: *See*—
Harp, Robert S., 3,942,130.
Wheeler, Bryce A., 3,941,923.

Hughes, George A., to Raymond Lee Organization, Inc., The, a part interest. Swimming pool cover. 3,940,809, Cl. 4-172.120.

Hughes Microelectronics Limited: *See*—
Fowler, Albert Lewis, 3,942,002.

Hughes Tool Company: *See*—
Stinson, Leon B., 3,941,197.

Hugi, Rolf: *See*—
Schmitter, Andre; Hugi, Rolf; and Seiz, Wolfgang, 3,941,725.

Huhn, M. Susan. Vote recording. 3,941,976, Cl. 235-54.00F.

Huhta-Kowisto, Esko Ensio, to Puolustusministerio. Sea water battery. 3,941,616, Cl. 136-100.00M.

Huignard, Jean Pierre: *See*—
Spitz, Erich; Huignard, Jean Pierre; and Royer, Odile, 3,941,450.

Humphrey, William Edwin, to Optical Research and Development Corporation. Inline optical wedge stabilizer. 3,941,451, Cl. 350-16.000.

Hund, Helmut: *See*—
Strasser, Bernd; Kramer, Wolfgang; Mose, Luciano; and Hund, Helmut, 3,941,675.

Hunkar, Denes B., to Hunkar Laboratories, Inc. Injection molding control system. 3,941,534, Cl. 425-145.000.

Hunkar Laboratories, Inc.: *See*—
Hunkar, Denes B., 3,941,534.

Hunter, Joe S.: *See*—
Stripling, William W.; White, Harold V.; and Hunter, Joe S., 3,941,345.

Huntley, James R.; and Southard, William Franklin, to James R. Huntley. Apparatus for cutting workpieces such as components for mitered corner picture frames with minimum waste. 3,941,020, Cl. 83-468.000.

Hunyar, Csaba K.; and Green, Jesse, to United Artists Music and Records Group, Inc. Phonograph record pressing die assembly. 3,941,547, Cl. 425-407.000.

Huper, Fritz; Rauenbusch, Erich; Schmidt-Kastner, Gunter; Bomer, Bruno; and Bartl, Herbert, to Bayer Aktiengesellschaft. New water-insoluble preparations of peptide materials, their production and their use. 3,941,756, Cl. 260-78.50R.

Hurkmans, Adrianus Cornelis Maria: *See*—
Vredenbregt, Jakob; Klomp, Antonius Maria; and Hurkmans, Adrianus Cornelis Maria, 3,941,137.

Hurst Performance, Inc.: *See*—
Cambria, Emanuel F., 3,941,008.

Hussey, Douglas. Heel and toe weighted golf club head. 3,941,390, Cl. 273-169.000.

Hustede, Helmut; Rudy, Hermann, deceased; by Rudy, Liselotte, nee Ringelmann, heir; by Rudy, Hans, heir; and by Sallewsky, Barbara, nee Rudy, heir, to Joh. A. Benckiser GmbH. Manufacture of citric acid by submerged fermentation. 3,941,656, Cl. 195-36.00R.

Huston, James E.; and Murre, Robert W., to Bell & Howell Company. Automatic film searching and retrieval system. 3,941,978, Cl. 235-61.11R.

Hutch, Frederick S., to Honeywell Inc. Threshold gate having a variable threshold level. 3,942,038, Cl. 307-235.00J.

Huxley, Hugh Esmor, to National Research Development Corporation. Rotating-anode x-ray tube. 3,942,015, Cl. 250-406.000.

Hyanova, Blanka; and Plasil, Vladimir, to CKD Praha, oborovy podnik. Piezoelectric pick-up device for measuring pressures within hollow bodies. 3,942,049, Cl. 310-9.100.

Hydril Company: *See*—
Mott, James D., 3,941,348.

I-T-E Imperial Corporation: *See*—
Gryctko, Carl E., 3,940,838.

ICI Australia Limited: *See*—
Bolto, Brian Alfred, 3,941,724.
Martin, Anwyn Margaret; Stewart, Donald Fergusson; and Swanson, Andrew Baikie, 3,941,583.

Ide, Allan R. Method and apparatus for storing and unloading bulk material. 3,941,258, Cl. 214-17.00D.

Idemitsu, Kosan Kabushiki-Kaisha (Idemitsu Kosan Co., Ltd.): *See*—
Tomikawa, Masami; Ishitobi, Hiroyuki; and Ohkawa, Hideo, 3,940,811.

Iijima, Tetsuya, to Nissan Motor Co., Ltd. Automatic transmission hydraulic control throttle valve. 3,941,143, Cl. 137-102.000.

Illinois Railway Equipment Company: *See*—
Sweger, Theodore J., 3,941,254.

Illinois Tool Works Inc.: *See*—
Braden, Denver, 3,941,242.

Ilvespaa, Atso; Gagneux, Andre; Schweizer, Ernst; and Frei, Jorg, to Ciba-Geigy Corporation. 1-Heteroarylsulphonyl-2-iminoimidazolidines. 3,941,804, Cl. 260-309.700.

Imperial Chemical Industries Limited: *See*—
Ackerley, Norman; and Mack, Peter Albert, 3,941,793.
Creasey, Norman Geoffrey; and Pike, Leslie Clark, 3,941,856.
King, Terence, 3,941,748.

Imperial Manufacturing Company: *See*—
Hill, James E., 3,940,815.

IMS Limited: *See*—
Ogle, Robert W., 3,941,131.

Ogle, Robert W., 3,941,171.
Inagaki, Junpei: *See—*
Tadakuma, Susumu; Inagaki, Junpei; and Tanaka, Shigeru, 3,942,085.
Indicator Controls Corporation: *See—*
Potter, Thomas R., 3,942,108.
Ing. C. Olivetti & C., S.p.A.: *See—*
Becchi, Raffaele; and Bisone, Dario, 3,941,229.
Ingham, Dickey E. Automobile engine warmer. 3,942,024, Cl. 290-38.00R.
Ingles, Nancy: *See—*
Isaac, Theodore N.; and Ingles, Nancy, 3,941,388.
Ingraham, Glen E., to Colorguard Corporation. Method of bonding a thermoplastic resinous protective coating to a metallic substrate. 3,941,866, Cl. 264-135.000.
Institut de Recherches de la Siderurgie Francaise (IRSID): *See—*
Vedda, Louis; and Leclercq, Alain, 3,941,183.
Institut Francaise du Petrole, des Carburants et Lubrifiants: *See—*
Chatard, Michel; Grolet, Pierre; Reynard, Remi; and Thiery, Jean, 3,941,146.
Institute of Textile Technology: *See—*
Cunnane, Francis J., III; and Word, Elizabeth L., 3,941,559.
Institutul de Cercetari si Proiectari Pentru Utilaj Chimic si Rafinarii: *See—*
Muscan, Alexandru Ioan, 3,940,973.
Interatom, Internationale Atomreaktorbau GmbH: *See—*
Lauhoff, Theodor; Quante, Manfred; Stickel, Kurt Erwin; Bolz, Egon; and Semma, Klaus, 3,940,996.
International Business Machines Corporation: *See—*
Lawlor, Francis Daniel, 3,942,155.
Matuck, George Coleman; Sienkiewicz, Gerald Carl; and Thorne, William Duncan, 3,941,231.
International Magna Corporation: *See—*
Placek, Eugene W., 3,941,116.
International Nickel Company, Inc., The: *See—*
Tundermann, John Hayes; and Harrington, John Herbert, 3,941,584.
International Standard Electric Corporation: *See—*
Graham, Keith; Korsky, Viacheslav; Elmer, Christopher; Pinede, Edouard; Litster, John; and Aarts, Jan, 3,941,936.
Reiber, Hans, 3,941,462.
Weiss, Eberhard, 3,941,707.
International Tapetronics Corporation: *See—*
Jenkins, John P., 3,942,189.
International Telephone and Telegraph Corporation: *See—*
Ash, David J.; and Colmey, John C., 3,941,895.
Holmes, Phillip L.; Cinkus, Frank; and Green, John Hugh, 3,941,939.
Matheny, Coy Edwin, 3,941,943.
Perrotti, Emmanual J.; and Leger, Donald Roy, 3,940,858.
Sourby, John C.; and Wallace, Charles H., 3,940,998.
International Video Corporation: *See—*
Louth, Kenneth, 3,942,084.
Inui, Toshiaki: *See—*
Nakamura, Shoichi; Inui, Toshiaki; and Horiike, Yoshio, 3,940,920.
Iowa Beef Processors, Inc.: *See—*
Anderson, A. D.; Lauridsen, Walter E.; and Overstreet, Charles L., 3,940,830.
Iriguchi, Norio: *See—*
Sumi, Momoki; Kanda, Goro; Iriguchi, Norio; Isohata, Susumu; and Sasaki, Kyoichi, 3,941,967.
Isaac, Kenneth N.: *See—*
Mock, Howard C.; Isaac, Kenneth N.; Disparte, Charles P.; and Hall, Warren L., 3,942,156.
Isaac, Theodore N.; and Ingles, Nancy, to Consumers Communication Corporation. Game and newspaper supplement. 3,941,388, Cl. 273-134.00G.
ISCO Manufacturing Company, Inc.: *See—*
Fisher, Don H.; Coons, Harold; and Highfill, Jackie, 3,941,260.
Ishiguro, Ginya: *See—*
Kato, Katsuhiro; Suzuki, Hideo; Yano, Norio; Kishimoto, Yojiro; and Ishiguro, Ginya, 3,942,142.
Ishii, Yukio: *See—*
Tshida, Naoyashi; Watanabe, Atsushi; and Ishii, Yukio, 3,941,115.
Ishitobi, Hiroyuki: *See—*
Tomikawa, Masami; Ishitobi, Hiroyuki; and Ohkawa, Hideo, 3,940,811.
Ishiyama, Akio: *See—*
Miyasaka, Tsutomu; and Ishiyama, Akio, 3,940,922.
Ishiyama, Jiro; Yokotsuka, Tamotsu; Kato, Motohiko; Yamaji, Nobuyuki; and Yoshida, Fumihiko, to Kikkoman Shoyu Co., Ltd. Method for purifying 3',5'-cyclic-adenylic acid or 3',5'-cyclic-deoxyadenylic acid. 3,941,770, Cl. 260-211.50R.
Isohata, Susumu: *See—*
Sumi, Momoki; Kanda, Goro; Iriguchi, Norio; Isohata, Susumu; and Sasaki, Kyoichi, 3,941,967.
Italsider S.p.A.: *See—*
Roncan, Riccardo, 3,941,086.
Itek Corporation: *See—*
Crumly, Charles B.; and Lindley, John P., 3,942,109.
O'Brien, John Augustus, 3,941,455.
Stumpf, Kenneth D.; and Watson, John T., 3,942,022.
Ito, Atsuo: *See—*
Uehara, Kenichiro; Ito, Atsuo; Nishimune, Koichi; and Fujita, Kazutoshi, 3,942,017.
Ito, Ichizo: *See—*
Yamasaki, Hiroo; Ito, Ichizo; and Shibata, Yukitake, 3,940,986.
Ito, Kanichi: *See—*
Hirayama, Yoshio; and Ito, Kanichi, 3,941,689.
Ito, Yuji: *See—*
Koike, Hiroshi; Fukui, Akio; Ito, Yuji; Tanaka, Takehiko; and Okuda, Yukio, 3,941,815.
Itoh, Hayami; Yamada, Mamoru; and Nozaki, Yasuo, to Kawasaki Jukogyo Kabushiki Kaisha. Method for disposal of waste synthetic high polymer. 3,941,066, Cl. 110-18.00R.
Itoh, Katsumi; and Mori, Kazumasa, to Nippondenso Co., Ltd. Voltage regulating system. 3,942,096, Cl. 322-28.000.
Itoh, Katsumi; and Mori, Kazumasa, to Nippondenso Co., Ltd. Voltage regulating system. 3,942,097, Cl. 322-28.000.
ITT Industries, Inc.: *See—*
Burgdorf, Jochen, 3,941,216.
ITW de France: *See—*
Nivet, Andre, 3,940,901.
Iuchi, Munenori: *See—*
Okada, Ryozo; Iuchi, Munenori; and Yamada, Munemitsu, 3,941,177.
IVAC Corporation: *See—*
Georgi, Heinz W., 3,942,123.
Ives, Gusti L.: *See—*
Carpenter, Ronald K.; and Ives, Gusti L., 3,941,333.
Iyama, Hiroyuki: *See—*
Tomura, Teruichi; Akatsuka, Mitsuo; and Iyama, Hiroyuki, 3,942,070.
Izen, Eliott H., to Crystal Craft Plastics Company, Inc. Display fixture. 3,941,251, Cl. 211-177.000.
Izumi, Sumio: *See—*
Saitoh, Kozo; and Izumi, Sumio, 3,941,688.
J & P Coats Limited: *See—*
Love, Ronald Barr; and Stewart, Alistair Templeton, 3,941,561.
Jab Company, Inc.: *See—*
Shields, Roger W., 3,941,933.
Jabsen, Felix S.; Schluderberg, Donald C.; and Paulson, Arnold E., to Babcock & Wilcox Company, The. Consolidated nuclear steam generator. 3,941,187, Cl. 165-157.000.
Jacaway, William A., Jr.: *See—*
Heady, Robert E.; and Jacaway, William A., Jr., 3,941,655.
Jackovitz, John F.; and Pantier, Earl A., to Westinghouse Electric Corporation. Method of preparing high capacity nickel electrode powder. 3,941,614, Cl. 136-29.000.
Jacks, Thomas J.: *See—*
Hensarling, Thomas P.; Jacks, Thomas J.; and Yatsu, Lawrence Y., 3,941,764.
Jackson, Albert. Screw propeller assemblies. 3,941,502, Cl. 416-83.000.
Jackson Products Company: *See—*
Medgebow, Irving; and White, Gene, 3,941,295.
Jackson, Robert G.; and Starks, Charles M., to Continental Oil Company. Predominantly aliphatic hydrocarbon materials from carbonaceous solids. 3,941,820, Cl. 260-449.600.
Jacob, Jean-Baptiste; Renoulin, Roger; and Le Drezen, Pierre, to Societe Lannionnaise d'Electronique Sle-Citeral; and Compagnie Industrielle des Telecommunications Cit-Alcatel. Connection unit for time division switching system. 3,941,947, Cl. 179-15.0AT.
Jacobs, Arthur W. Reciprocating screw injection molding machine with hydraulic actuating mechanism with prefill valve. 3,941,549, Cl. 425-451.200.
Jacque, Donald A.: *See—*
Rausch, Donald L.; and Jacque, Donald A., 3,940,893.
Jaffe, James M., to General Motors Corporation. Diaphragm formation on silicon substrate. 3,941,629, Cl. 156-8.000.
James, Frank W., Jr., to Westinghouse Electric Corporation. Resistance brazing of solid copper parts to stranded copper parts with phos-silver. 3,941,971, Cl. 219-85.000.
James R. Huntley: *See—*
Huntley, James R.; and Southard, William Franklin, 3,941,020.
Janoski, Florian B., to Atlas Powder Company. Blasting cap adapter for severing blasting circuit leads. 3,941,056, Cl. 102-22.000.
Japan Atomic Energy Research Institute: *See—*
Machi, Sueo; Suwa, Takeshi; Takehisa, Masaaki; and Seguchi, Tadao, 3,941,671.
Japan Ship's Machinery Development Association: *See—*
Tshida, Naoyashi; Watanabe, Atsushi; and Ishii, Yukio, 3,941,115.
Jarr, Klaus D.: *See—*
Hiller, Trueman W.; and Jarr, Klaus D., 3,941,168.
Jarvis, Timothy Robert: *See—*
Claridge, Geoffrey Maximilian Lawrence; Driver, Brian Sydney; and Jarvis, Timothy Robert, 3,942,019.
Jefferson Chemical Company, Inc.: *See—*
Gipson, Robert Malone, 3,941,711.
Jenkins, Edwin E.: *See—*
Dwyer, Francis G.; and Jenkins, Edwin E., 3,941,871.
Jenkins, John P., to International Tapetronics Corporation. Magnetic tape reproducing apparatus with solenoid actuated tape lifter means and automatic control therefor. 3,942,189, Cl. 360-13.000.
Jenkins, William A., to Monarch Marking Systems, Inc. Label printing and applying apparatus. 3,941,289, Cl. 226-76.000.
Jenn Air Corporation: *See—*
Cerola, Joseph J.; and Jenn, Louis J., 3,941,043.
Jenn, Louis J.: *See—*
Cerola, Joseph J.; and Jenn, Louis J., 3,941,043.

Jimerson, Bruce D.: *See—*
Kidder, Richard A.; Nakasone, Henry H.; and Jimerson, Bruce D., 3,941,397.

Jin, Katsuyuki: *See—*
Moriyama, Hiromi; Kuwabara, Motosuke; Jin, Katsuyuki; and Tsuruda, Tadao, 3,941,952.

Joans, Andre, to Societe Alsacienne de Constructions Mecaniques de Mulhouse. Weft mixer devices for looms. 3,941,158, Cl. 139-122.00W.

Jobin-Yvon: *See—*
Laude, Jean Pierre; and Pieuchard, Guy, 3,942,048.

Joh. A. Benckiser GmbH: *See—*
Hustede, Helmut; Rudy, Hermann, deceased; Rudy, Liselotte, nee Ringelmann, heir; Rudy, Hans, heir; and Sallewsky, Barbara, nee Rudy, heir, 3,941,656.

Johannsmeier, Karl-Heinz, to Automated Equipment Corporation. Wire bonding apparatus with improved Z-axis motion control. 3,941,294, Cl. 228-4.500.

John Zink Company: *See—*
Reed, Robert D., 3,940,988.

Johnson, Bruce K.: *See—*
Blinow, Igor; Johnson, Bruce K.; and Whiteside, George D., 3,942,184.

Johnson, Charles S.: *See—*
Baker, William O.; and Johnson, Charles S., 3,940,807.

Johnson, Dale E. Support shaft apparatus. 3,941,328, Cl. 242-68.400.

Johnson, David A.: *See—*
Silvestri, Herbert H.; and Johnson, David A., 3,941,773.

Johnson, Louis B. Automotive cooling system filter assembly. 3,941,697, Cl. 210-167.000.

Johnson, Melvin L.; and Shawver, Bruce M., to United States of America, Energy Research and Development Administration. Quick release latch for reactor scram. 3,941,413, Cl. 294-86.00A.

Johnson, Robert Phillip, to Michigan Chemical Corporation. Preparation of halogenated nitriles. 3,941,827, Cl. 260-465.700.

Jones, Joie P., to Bolt Beranek and Newman, Inc. High frequency ultrasonic process and apparatus for selectively dissolving and removing unwanted solid and semi-solid materials and the like. 3,941,122, Cl. 128-24.00A.

Jones, Robert J.: *See—*
McCollum, Robert F.; Jones, Robert J.; and Deck, Philip E., 3,941,327.

Jorgensen, Arne, to Lever Brothers Company. Stackable packaging container. 3,941,301, Cl. 229-14.0BE.

Josephson, Joseph Pollack, to Visual Planning Corporation. Magnetic boards and components. 3,942,147, Cl. 335-285.000.

Jost, Ernest M.; Reenstra, Arthur L.; and Trenkler, George, to Texas Instruments Incorporated. Transducer. 3,940,992, Cl. 73-398.00R.

Joyce Western Corporation: *See—*
Parker, William D., 3,941,531.

Jumelle, Louis Francois, to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Jet engine nacelle with drag augmenter auxiliary for thrust-reverser system. 3,941,313, Cl. 239-265.290.

Junker, Werner: *See—*
Stahl, Ulrich; Busse, Oswald; Klesper, Hugo; and Junker, Werner, 3,941,701.

Juvinall, John W., to Owens-Illinois, Inc. Inspection machine memory. 3,941,686, Cl. 209-74.00M.

K.T. Corporation: *See—*
Kaufman, Albert N., 3,940,898.

Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft: *See—*
Buschkamp, Heinz, 3,941,913.
Ziemek, Gerhard, 3,941,296.

Kabushiki Kaisha Daikin Seisakusho: *See—*
Murakami, Kiyoharu, 3,941,223.

Kabushiki Kaisha Honda Lock: *See—*
Kuroki, Shigenori, 3,940,958.

Kabushiki Kaisha Meidensha: *See—*
Umeya, Eiji; and Yanagisawa, Hifumi, 3,941,960.

Kabushiki Kaisha Ochiai Seisakusho: *See—*
Kazama, Hachiro, 3,941,436.

Kabushiki Kaisha Ricoh: *See—*
Abe, Takeshi; and Fukushima, Yoshio, 3,941,981.

Kabushiki Kaisha Suwa Seikosha: *See—*
Maezawa, Shuji, 3,941,454.
Miyasaka, Tsutomu; and Ishiyama, Akio, 3,940,922.

Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See—*
Kurii, Masaaki; Kobari, Kiyoshi; and Yanagi, Osamu, 3,941,204.

Kadota, Shozo: *See—*
Fujimoto, Yoshiji; Kadota, Shozo; Yasuda, Michio; Hayashi, Shinichi; and Hananoi, Toshihiro, 3,942,169.

Kadowaki, Takashi: *See—*
Denda, Yasuaki; Kadowaki, Takashi; and Dohi, Michio, 3,941,738.

Kaelin, Bette M.; and Terzian, Rouben T., to Marvin Glass & Associates. Doll joint structures. 3,940,880, Cl. 46-161.000.

Kaempfer, Knut: *See—*
Broecker, Franz Josef; Zirker, Guenter; Triebskorn, Bruno; Marosi, Laszlo; Schwarzmann, Matthias; Dethlefsen, Winfried; and Kaempfer, Knut, 3,941,721.

Kaffenberger, Ernst, to Licentia Patent-Verwaltungs-G.m.b.H. Flange. 3,942,141, Cl. 333-98.00R.

Kageyama, Takao; and Morizumi, Yoshiro, to Nippon Electric Company Limited. Velocity modulation tube including a high resonance-frequency floating prebuncher having a q-value lower than a low resonance-frequency input cavity. 3,942,066, Cl. 315-5.430.

Kahr, Kurt: *See—*
Fuchs, Hugo; Gath, Rudolph; Kahr, Kurt; and Kartte, Klaus, 3,941,838.

Kaiji Denki Kabushiki Kaisha: *See—*
Kawase, Katsuyuki; Sato, Mutumi; Hamada, Kuniaki; and Hayashi, Seiji, 3,941,985.

Kaiser Aluminum & Chemical Corporation: *See—*
McLaughlin, Hollis G., 3,941,272.

Kali und Salz Aktiengesellschaft: *See—*
Singewald, Arno; and Fricke, Gunther, 3,941,685.

Kalmar Verkstads AB: *See—*
Petersson, Ralf Krister Ebbe, 3,941,408.

Kamensky, Leonid Alexeevich: *See—*
Bondarenko, Oleg Petrovich; Medovar, Boris Izrailevich; Podola, Nikolai Vasilievich; Kravchuk, Anatoly Iosifovich; Marchenko, Alexandr Mikhailovich; Baglai, Vitaly Mikhailovich; Vernik, Alexandr Borisovich; Kamensky, Leonid Alexeevich; Us, Vasily Ivanovich; Mokhnach, Vladislav Konstantinovich; and Andrianov, Georgy Grigorievich, 3,942,105.

Kaminski, Elton G., to Stolle Corporation, The. Product transfer system. 3,941,070, Cl. 113-7.00A.

Kanbara, Shu: *See—*
Yukuta, Toshio; Kojima, Minoru; Onishi, Akira; and Kanbara, Shu, 3,941,847.

Kanda, Goro: *See—*
Sumi, Momoki; Kanda, Goro; Iriguchi, Norio; Isohata, Susumu; and Sasaki, Kyoichi, 3,941,967.

Kaneda, Isao, to NEC Sylvania Corporation. Discharge lamp lighting apparatus and method. 3,942,069, Cl. 315-99.000.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See—*
Wakabayashi, Hiroshi; Nakagawa, Toru; Matsumura, Shoichi; and Fujii, Shigeru, 3,941,757.

Kanngiesser, Karl Werner, to Brown, Boveri & Cie., AG. D.C. voltage transformation in high tension systems. 3,942,089, Cl. 321-2.000.

Kano, Motomi; Shioyama, Hitoshi; Takeuti, Yasuhito; and Niikawa, Masahiro, to Kobe Steel Ltd. Arc welding process. 3,941,974, Cl. 219-137.00R.

Kanor, Steven E., to LNIH, Inc. Method and apparatus for tissue disaggregation. 3,941,317, Cl. 241-21.000.

Kanzelberger, James C., to Contemporary, Inc. Plastic plates adapted to be imprinted and methods of manufacturing and imprinting on plastic plates. 3,940,864, Cl. 40-136.000.

Kapany, Narinder S.; and Unterleitner, Fred C., to Kaptron, Inc. Optical projector/reader. 3,941,467, Cl. 353-34.000.

Kaplan, Lloyd A.: *See—*
Shipp, Kathryn G.; and Kaplan, Lloyd A., 3,941,853.

Kaplan, Louis. System for mounting three dimensional letters. 3,940,866, Cl. 40-142.00R.

Kaplan, Martin Louis; and Wudl, Fred, to Bell Telephone Laboratories, Incorporated. Technique for preparation of fulvalenes. 3,941,809, Cl. 260-327.00M.

Kapoor, Inder: *See—*
Metcalf, Robert L.; Kapoor, Inder; and Hirwe, Asha, 3,941,842.

Kapp, Jack R.: *See—*
Dolling, William T.; and Kapp, Jack R., 3,941,433.

Kappas, Chris S. Detachable power unit for a golf bag cart. 3,941,198, Cl. 180-11.000.

Kapper, Gerhard: *See—*
Grutter, Walter; and Kapper, Gerhard, 3,941,211.

Kaptron, Inc.: *See—*
Kapany, Narinder S.; and Unterleitner, Fred C., 3,941,467.

Karalus, George C.: *See—*
Figge, Erwin E.; Hapke, Kenyon A.; Karalus, George C.; and Lenell, Robert C., 3,941,465.

Karl Lautenschlager KG Mobelbeschlaegfabrik: *See—*
Lautenschlaeger, Karl, 3,940,828.

Kartinen, Ernest O.: *See—*
Kelly, Edward H.; and Kartinen, Ernest O., 3,940,832.

Kartte, Klaus: *See—*
Fuchs, Hugo; Gath, Rudolph; Kahr, Kurt; and Kartte, Klaus, 3,941,838.

Kasahara, Nobuo; Shiota, Asao; and Kitaguchi, Isamu, to Sanwa Kagaku Kenkyusho Co., Ltd. Process for the growth and production of mushroom tissue. 3,940,883, Cl. 47-1.100.

Kasik, Robert L.; and Peterson, Marvin A., to Beatrice Foods Co. Synergistic combination cheese extender. 3,941,891, Cl. 426-94.000.

Kato, Katsuhiro; Suzuki, Hideo; Yano, Norio; Kishimoto, Yojiro; and Ishiguro, Ginya, to Nippon Telegraph and Telephone Public Corporation. Electromagnetic coordinate selection device. 3,942,142, Cl. 335-112.000.

Kato, Motohiko: *See—*
Ishiyama, Jiro; Yokotsuka, Tamotsu; Kato, Motohiko; Yamaji, Nobuyuki; and Yoshida, Fumihiko, 3,941,770.

Katsuda, Yoshio, to Dainippon Jochugiku Kabushiki Kaisha. Cockroach trap. 3,940,874, Cl. 43-114.000.

Katzman, Allison: *See—*
Glass, Marvin I.; Katzman, Allison; and Aleksa, Peter, 3,940,879.

Kaub, Manfred, to Girling Limited. Vehicle brake adjuster. 3,941,217, Cl. 188-79.5GT.

Kauferle, Josef; and Reichert, Konrad, to BBC Brown Boveri & Company Limited. Adjustable reactive power compensator for a transmission line. 3,942,100, Cl. 323-106.000.

Kaufman, Albert N., to K.T. Corporation. Double-pane window containing dry atmosphere and method for producing same. 3,940,898, Cl. 52-400.000.

Kaup, Friedel; and Warnke, Heinrich, to Miele & Cie. Level control for surface treatment baths. 3,941,147, Cl. 137-453.000.

Kawabata, Hidetoshi, to Minolta Camera Kabushiki Kaisha. Electrophotographic method of transferring toner image. 3,941,592, Cl. 96-1.400.

Kawada, Mitsuo, to Kito Machine Industries Company Limited. Rotary strainer. 3,941,702, Cl. 210-391.000.

Kawada, Tousuke. Steering means with positive steerage for automobiles. 3,941,200, Cl. 180-79.20R.

Kawakami, Hirotake; Matsuda, Atsushi; and Takahashi, Kazumasa, to Sony Corporation. Electrostatic transducer assembly. 3,941,946, Cl. 179-111.00R.

Kawakami, Hirotake; and Takada, Kantaro, to Sony Corporation. Electrostatic transducer. 3,942,029, Cl. 307-88.0ET.

Kawakami, Tadashi, to Nippon Kogaku Kabushiki Kaisha. Symmetrical type four-component lens system. 3,941,457, Cl. 350-220.000.

Kawakami, Tatsuya: *See*—
Akami, Hitoshi; Nishikawa, Shigeru; and Kawakami, Tatsuya, 3,942,154.

Kawamoto, Kinji, to Matsushita Electric Industrial Co., Ltd. Electronic expression device for producing tremulant effect. 3,941,025, Cl. 84-1.250.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Itoh, Hayami; Yamada, Mamoru; and Nozaki, Yasuo, 3,941,066.

Kawase, Katsuyuki; Sato, Mutumi; Hamada, Kuniaki; and Hayashi, Seiji, to Nippon Electric Company Limited; and Kaiji Denki Kabushiki Kaisha. Apparatus for carrying out bonding at programmed positions of a circuit element and at corrected positions of leads therefor. 3,941,985, Cl. 235-151.100.

Kay Manufacturing Corporation: *See*—
Krakauer, Daniel; and Krakauer, C. Leonard, 3,940,810.

Kayano, Tatsuo: *See*—
Mohri, Katsuo; Fukuda, Masaaki; Kayano, Tatsuo; and Yoshino, Takehiko, 3,941,920.

Kazama, Hachiro, to Kabushiki Kaisha Ochiai Seisakusho. Bearing for light rotary shafts. 3,941,436, Cl. 308-72.000.

Keeling, William E. Speed detector and indicator for DC motors. 3,942,114, Cl. 324-177.000.

Kehler, Paul, to Applied Inventions Corporation. Dual spaced, borehole compensated neutron well logging instrument. 3,942,004, Cl. 250-266.000.

Keiser, Fritz, to Precisa AG. Rechenmaschinenfabrik, Firma. Electromagnetically operated printer. 3,941,228, Cl. 197-18.000.

Keller, D. V., Jr.: *See*—
Smith, Clay D.; and Keller, D. V., Jr., 3,941,679.

Kelley, Arthur P. Rotary internal combustion engine. 3,940,925, Cl. 60-39.450.

Kelly, Edward H.; and Kartinen, Ernest O., to Burmah Oil and Gas Company. Strapping for fastening production tubing to electrical cable. 3,940,832, Cl. 24-20.00R.

Kelly, Michael G.: *See*—
Newman, Irvin; and Kelly, Michael G., 3,941,975.

Kelso, John W. Apparatus for manufacturing seamless metal tubular products. 3,941,184, Cl. 164-270.000.

Kemanord Aktiebolag: *See*—
Nisser, Henrik Gustaf Folke; Petersen, Jorgen; and Porrvik, Sten Erik, 3,941,634.

Kendall, Robert L.: *See*—
Ver Nooy, Burton; Payne, Larry D.; and Kendall, Robert L., 3,940,855.

Kennametal Inc.: *See*—
Friedline, Ernest J.; and Mitchell, Robert N., 3,940,835.

Kennedy, Christopher Patrick: *See*—
Clancy, John Mathew; Howard, Rodney William; Wiese, Brian Leslie; Hipsley, Richard Eben; and Kennedy, Christopher Patrick, 3,941,045.

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Kennedy, Roland R.: *See*—
Clucker, Richard V.; and Kennedy, Roland R., 3,941,263.

Kent-Moore Corporation: *See*—
De Martelaere, David L., 3,941,172.

Kesinger, Donald A., to Gates Rubber Company, The. Plant cover and actuator. 3,940,936, Cl. 60-531.000.

Kesterson, Robert H.: *See*—
Bowden, James E.; and Kesterson, Robert H., 3,941,165.

Key, Edgar T.: *See*—
Wang, Tsu-Huai; and Key, Edgar T., 3,941,633.

Kidd, Norman D.: *See*—
Hall, Richard C.; Kidd, Norman D.; and Daravingas, George V., 3,941,894.

Kidder, Richard A.; Nakasone, Henry H.; and Jimerson, Bruce D. Ski device. 3,941,397, Cl. 280-11.35N.

Kikkoman Shoyu Co., Ltd.: *See*—
Ishiyama, Jiro; Yokotsuka, Tamotsu; Kato, Motohiko; Yamaji, Nobuyuki; and Yoshida, Fumihiko, 3,941,770.

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Kimberly-Clark Corporation: *See*—
Werner, Edward E.; and Mitchell, Jerome L., 3,940,831.

Kind, Dieter; and Brumshagen, Harald, to Kind, Dieter. Arrangement for the testing of high voltage direct current switches. 3,942,103, Cl. 324-28.00R.

King, Paul A.: *See*—
Miller, Walter A.; Shaw, Richard G.; and King, Paul A., 3,941,865.

King, Terence, to Imperial Chemical Industries Limited. Process for preparing aromatic polymers in presence of alkali metal fluoride. 3,941,748, Cl. 260-47.00R.

King, William James; Murray, Leo Thomas; and Salzman, Gerhard Martin, to Colgate-Palmolive Company. Dentifrice composition. 3,941,877, Cl. 424-52.000.

Kinney, David William, to Air Distribution Associates, Inc. Cooking fume removal. 3,941,039, Cl. 98-115.00K.

Kinsman, Donald V.: *See*—
Gilbert, Allan H.; and Kinsman, Donald V., 3,941,710.

Kinsolving, C. Richard: *See*—
Carr, Albert A.; and Kinsolving, C. Richard, 3,941,795.

Kinzler, Oskar Leonard: *See*—
Paule, Helmut Paul; and Kinzler, Oskar Leonard, 3,941,379.

Kirk, James Robert; and Kirk, Lark Warren. Paper art process. 3,941,631, Cl. 156-59.000.

Kirk, Lark Warren: *See*—
Kirk, James Robert; and Kirk, Lark Warren, 3,941,631.

Kirk, Norbert A. Handlebar shock absorber. 3,941,011, Cl. 74-551.200.

Kishimoto, Yojiro: *See*—
Kato, Katsuhiro; Suzuki, Hideo; Yano, Norio; Kishimoto, Yojiro; and Ishiguro, Ginya, 3,942,142.

Kitaguchi, Isamu: *See*—
Kasahara, Nobuo; Shiota, Asao; and Kitaguchi, Isamu, 3,940,883.

Kitajima, Nobuo: *See*—
Hanada, Hiroshi; Kitajima, Nobuo; and Masaki, Tatsuo, 3,941,591.

Kitano, Ichiro; Koizumi, Ken; and Matsumura, Hiroyoshi, to Nippon Selfoc Kabushiki Kaisha. Light-conducting glass structures. 3,941,474, Cl. 350-96.0GN.

Kitayama, Minoru: *See*—
Takashina, Kikuo; Kitayama, Minoru; Nakamura, Motoharu; Suga, Yozo; and Tanaka, Kiyoshi, 3,941,623.

Kito Machine Industries Company Limited: *See*—
Kawada, Mitsuo, 3,941,702.

Klasna, Harold D. Dumping apparatus for combines. 3,941,420, Cl. 298-26.000.

Klausner, Arnold: *See*—
Yankowski, Anthony P.; and Klausner, Arnold, 3,941,402.

Klee, Richard E.; and Varozza, Joseph A., III, to Varian Associates. High pressure sample injection apparatus and method. 3,940,994, Cl. 73-422.0GC.

Klein, Alfons: *See*—
Pelz, Willibald; Credner, Hans-Heinrich; Schulte, Walter; Klein, Alfons; Wedemeyer, Karlfried; and Nittel, Fritz, 3,941,601.

Klein, Max, to Normac, Inc. Styrene suspension polymerization system for spheres. 3,941,729, Cl. 260-17.00A.

Klein, Norman Edward; and Addis, Kenneth James, to Deering Milliken Research Corporation. Apparatus for guiding a strip to a support surface. 3,941,644, Cl. 156-433.000.

Kleiner, Hans-Jerg; Finke, Manfred; Bollert, Ulrich; and Herwig, Walter, to Hoechst Aktiengesellschaft. Flame retarding linear polyesters and shaped articles thereof. 3,941,752, Cl. 260-75.00P.

Klement, Gunter; Baumann, Horst; and Scheidt, Eugen, to Henkel & Cie G.m.b.H. Parting agent for elastomer compositions. 3,941,907, Cl. 428-341.000.

Klesper, Hugo: *See*—
Stahl, Ulrich; Busse, Oswald; Klesper, Hugo; and Junker, Werner, 3,941,701.

Kletecka, George; and Forry, Mark E., to B. F. Goodrich Company, The. Purification of N,N-di-2-naphthyl-p-phenylenediamine using a mixed solvent system. 3,941,843, Cl. 260-576.000.

Klingebiel, Ward J., to Union Carbide Corporation. Apparatus for forming thermoplastic articles. 3,941,529, Cl. 425-4.00R.

Klitsov, Alexandr Abramovich: *See*—
Konstantinov, Alexei Kirillovich; Volkov, Vladimir Vasilievich; Gaschenko, Viktor Petrovich; Lukashkov, Igor Vladimirovich; Klitsov, Alexandr Abramovich; and Kuzmenko, Valentin Timofeevich, 3,940,813.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See*—
Buchner, Heinrich, 3,941,557.

Klomp, Antonius Maria: *See*—
Vredenbregt, Jakob; Klomp, Antonius Maria; and Hurkmans, Adrianus Cornelis Maria, 3,941,137.

Kluczynski, Matthew L., to Bendix Corporation, The. Quieting means for a fluid flow control device using vortical flow patterns. 3,941,350, Cl. 251-127.000.

Kluttz, Walter A. Spinning ring mounting means. 3,940,915, Cl. 57-122.000.

Kmak, Walter S.; and Yates, David J. C., to Exxon Research and Engineering Company. Regeneration procedure. 3,941,682, Cl. 208-140.000.

Knell, Martin: *See*—
Dexter, Martin; Knell, Martin; and Brunetti, Heimo, 3,941,745.

Knoll International, Inc.: *See*—Zapf, Otto, 3,940,812.

Knollenberg, Robert George; and Dascher, Albury John, to Particle Measuring Systems, Inc. Method and apparatus for two-dimensional data acquisition. 3,941,982, Cl. 235-92.0DP.

Knorr-Bremse GmbH: *See*—
Kubath, Gerhard; and Pollinger, Hans, 3,941,430.

Knudsen, Will B., to Servo Corporation of America. Directional wheel detector. 3,941,338, Cl. 246-77.000.

Kobari, Kiyoshi: *See*—
Kurii, Masaaki; Kobari, Kiyoshi; and Yanagi, Osamu, 3,941,204.

Kobashi, Uichiro: *See—*
Adachi, Yoshiharu; and Kobashi, Uichiro, 3,941,142.

Kobayashi, Makio: *See—*
Uchiyama, Hisashi; Meno, Naohiko; Senjo, Teizo; and Kobayashi, Makio, 3,941,572.

Kobayashi, Nobuyuki; and Nakada, Masahiko, to Toyota Jidosha Kogyo Kabushiki Kaisha. Arrangement for heating the suction gases of an internal combustion engine. 3,941,106, Cl. 123-122.0AC.

Kobe Steel Ltd.: *See—*
Kano, Motomi; Shioyama, Hitoshi; Takeuti, Yasuhito; and Niikawa, Masahiro, 3,941,974.

Koch, Robert B.; and Skogen, John D., to Honeywell Inc. Blood alcohol analyzer. 3,941,659, Cl. 195-103.50R.

Koch, Werner, to Sandoz Ltd., (Sandoz AG). Coumarin compounds. 3,941,780, Cl. 260-243.00D.

Koebner, Adolf. Sulfonation of aromatic compounds in the presence of solvents. 3,941,810, Cl. 260-329.00S.

Koehring Company: *See—*
Six, John W.; and Kramer, Virgil F., 3,941,252.
Wallenfang, Jerome A.; and Witt, Wilmer E., 3,940,913.

Kohler, Werner; and Steinemer, Norbert, to Siemens Aktiengesellschaft. Vacuum switching apparatus with a drive unit at ground potential. 3,941,959, Cl. 200-144.00B.

Koike, Hiroshi; Fukui, Akio; Ito, Yuji; Tanaka, Takehiko; and Okuda, Yukio, to Nippon Shokubai Kagaku Kogyo Co., Ltd. Process for the preparation of 5-nitro-1,4-naphthoquinone. 3,941,815, Cl. 260-396.00R.

Koizumi, Ken: *See—*
Kitano, Ichiro; Koizumi, Ken; and Matsumura, Hiroyoshi, 3,941,474.

Kojima, Minoru: *See—*
Yukuta, Toshio; Kojima, Minoru; Onishi, Akira; and Kanbara, Shu, 3,941,847.

Koleff, Boris: *See—*
Schatka, Gunther; Kruger, Wilm; Paulus, Rudolf; Koleff, Boris; Pattis, Erich; and Hartwig, Karl, 3,941,471.

Kolk, Erich: *See—*
Herbeck, Rudolf; Kolk, Erich; Schweier, Guenther; Schick, Hans; and Urban, Friedrich, 3,941,760.

Komada, Tadashi: *See—*
Yosioka, Takayuki; Komada, Tadashi; Sugano, Akira; and Fukumaru, Takafumi, 3,942,088.

Kommanditbolaget United Stirling (Sweden) AB & Co.: *See—*
Hakansson, Sven Anders Samuel, 3,940,934.

Konstantinov, Alexei Kirillovich; Volkov, Vladimir Vasilievich; Gaschenko, Viktor Petrovich; Lukashkov, Igor Vladimirovich; Klitsov, Alexandr Abramovich; and Kuzmenko, Valentin Timofeevich. Collapsible trailer boat. 3,940,813, Cl. 9-2.00C.

Kontani, Ryozo: *See—*
Seki, Kunio; and Kontani, Ryozo, 3,942,128.

Kopplin, Horst, to Siemens Aktiengesellschaft. Contact arrangement for a vacuum switch. 3,941,961, Cl. 200-144.00B.

Korenkov, Vladimir Nikolaevich: *See—*
Romanenko, Vitaly Ivanovich; Kuznetsov, Sergei Ivanovich; and Korenkov, Vladimir Nikolaevich, 3,941,691.

Kornbrink, Hans Folke Georg: *See—*
Hardmark, Ragnar Malcus; and Kornbrink, Hans Folke Georg, 3,940,945.

Korsky, Viacheslav: *See—*
Graham, Keith; Korsky, Viacheslav; Elmer, Christopher; Pinede, Edouard; Litster, John; and Aarts, Jan, 3,941,936.

Koski, Erkki, to Valmet Oy. Twin-wire paper manufacturing machines. 3,941,651, Cl. 162-301.000.

Kostylev, Alexandr Dmitrievich; Gurkov, Konstantin Stepanovich; Tupitsyn, Konstantin Konstantinovich; and Kreimer, Vladimir Isaakovich. Impact action mechanism. 3,941,101, Cl. 123-46.00H.

Kot, Casey: *See—*
Olinger, Charles P.; Ohlhaber, Ronald L.; and Kot, Casey, 3,941,121.

Kotera, Hiroaki: *See—*
Tsuchiya, Hiroyoshi; Yoshida, Kunio; Tsuda, Yukifumi; Hayami, Heijiro; and Kotera, Hiroaki, 3,941,922.

Kouklik, Ivo, to Elitex. System for centrally controlling a plurality of knitting machines. 3,940,953, Cl. 66-154.00A.

Kovacs, Gabor: *See—*
Freygang, Hans-Joachim; and Kovacs, Gabor, 3,942,099.

Koyanagi, Harusige: *See—*
Oishi, Masanori; Koyanagi, Harusige; and Matsumoto, Kazuo, 3,941,914.

Kraft, Karl-Josef: *See—*
Maassen, Dieter; Nast, Roland; Bormann, Heinrich; Piechota, Helmut; and Kraft, Karl-Josef, 3,941,769.

Kraftwerk Union Aktiengesellschaft: *See—*
Abolins, Arnold; Massar, Ernst; and Weghaupt, Erich, 3,942,053.
Michel, Rupprecht, 3,941,099.

Krakauer, C. Leonard: *See—*
Krakauer, Daniel; and Krakauer, C. Leonard, 3,940,810.

Krakauer, Daniel; and Krakauer, C. Leonard, to Kay Manufacturing Corporation. Box spring, box spring frame and making same. 3,940,810, Cl. 5-241.000.

Krakauer, Merrill. Article vending apparatus. 3,941,279, Cl. 221-86.000.

Kramer, Charles John. Ring laser having elastic wave bias. 3,941,481, Cl. 356-106.0LR.

Kramer, Virgil F.: *See—*
Six, John W.; and Kramer, Virgil F., 3,941,252.

Kramer, Wolfgang: *See—*
Strasser, Bernd; Kramer, Wolfgang; Mose, Luciano; and Hund, Helmut, 3,941,675.

Kraus, Charles Edward. Traction roller transmission. 3,941,004, Cl. 74-206.000.

Kraus, Peter: *See—*
Hermann, Walter; and Kraus, Peter, 3,941,201.

Krause, Dieter: *See—*
Olsen, Willi; Lieske, Manfred; Ehmann, Wolfgang; Krause, Dieter; and Perst, Gerhard, 3,942,030.

Krause, Marvin W.; Strobel, Donald H.; and Seruga, Edward A., to Badger Meter, Inc. System for testing flow meters. 3,940,971, Cl. 73-3.000.

Krause, Richard P. Article support. 3,941,325, Cl. 242-55.540.

Kravchuk, Anatoly Iosifovich: *See—*
Bondarenko, Oleg Petrovich; Medovar, Boris Izrailevich; Podola, Nikolai Vasilievich; Kravchuk, Anatoly Iosifovich; Marchenko, Alexandr Mikhailovich; Baglai, Vitaly Mikhailovich; Vernik, Alexandr Borisovich; Kamensky, Leonid Alexeevich; Us, Vasily Ivanovich; Mokhnach, Vladislav Konstantinovich; and Andrianov, Georgy Grigorievich, 3,942,105.

Krebs, Peter Eric; and Walters, Frank, to Ferranti, Limited. Gas-discharge display device driving circuits. 3,942,071, Cl. 315-169.0TV.

Kreimer, Vladimir Isaakovich: *See—*
Kostylev, Alexandr Dmitrievich; Gurkov, Konstantin Stepanovich; Tupitsyn, Konstantin Konstantinovich; and Kreimer, Vladimir Isaakovich, 3,941,101.

Kristen, Reiner; and Liska, Manfred, to Siemens Aktiengesellschaft. Stator winding for a miniature brushless DC motor. 3,942,054, Cl. 310-179.000.

Kritzberg, Nathan I., to Psychotherapeutic Devices, Inc. Psychological testing and therapeutic game device. 3,940,863, Cl. 35-22.00R.

Krohn, Hellmut: *See—*
Burckhardt, Manfred H.; Krohn, Hellmut; Grossner, Horst; and Florus, Hans-Jorg, 3,942,036.

Kronogard, Sven-Olof, to United Turbine AB & Co., Kommanditbolag. Compressor having two or more stages. 3,941,499, Cl. 415-116.000.

Kruger, Uwe, to U.S. Philips Corporation. Birefringent compounds used in Kerr cells. 3,941,453, Cl. 350-150.000.

Kruger, Wilm: *See—*
Schatka, Gunther; Kruger, Wilm; Paulus, Rudolf; Koleff, Boris; Pattis, Erich; and Hartwig, Karl, 3,941,471.

Ksiensyk, Klaus; and Chatterjee, Barun Kumar, to Bergische Stahl-Industrie. Rail vehicle coupler with cable coupling. 3,941,253, Cl. 213-1.300.

Kubath, Gerhard; and Pollinger, Hans, to Knorr-Bremse GmbH. Electrically controlled load-responsive air braking system. 3,941,430, Cl. 303-22.00R.

Kugelfischer Georg Schafer & Co.: *See—*
Schuster, Friedrich, 3,940,914.

Kugler, Tibor; and Rieger, Hans Wolfhart, to Swiss Aluminium Ltd. Method of coating electrodes. 3,941,899, Cl. 427-34.000.

Kuhn, Klaus Roland; and Stigler, Viktor, to Siemens Aktiengesellschaft. Spark ignited combustion engine analyzer. 3,942,102, Cl. 324-16.00R.

Kumata, Seiji: *See—*
Tsuruta, Hidemasa; Hiwatashi, Yukinori; Hirabayashi, Teruhiko; and Kumata, Seiji, 3,941,875.

Kummer, Rudolf; Nienburg, Hans-Juergen; Hohenschutz, Heinz; Strohmeyer, Max; and Teutsch, Theo, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Manufacture of predominantly straight-chain aldehydes. 3,941,848, Cl. 260-604.0HF.

Kurbi & Niggeloh: *See—*
Meinunger, Helmut, 3,941,492.

Kurii, Masaaki; Kobari, Kiyoshi; and Yanagi, Osamu, to Nippondenson Co., Ltd.; Toyota Jidosha Hanbai Kabushiki Kaisha; and Kabushiki Kaisha Tokai Rika Denki Seisakusho. Engine automatic control system for vehicles. 3,941,204, Cl. 180-111.000.

Kurio, Noriyuki: *See—*
Shin, Keiichiro; Ozeki, Hiroshi; and Kurio, Noriyuki, 3,941,523.

Kurita, Takaji, to Minolta Camera Kabushiki Kaisha. Automatic toner supplying device. 3,941,084, Cl. 118-7.000.

Kuritani, Masaaki: *See—*
Hashimoto, Naoto; Kuritani, Masaaki; and Toukai, Noriaki, 3,941,823.

Kuroki, Shigenori, to Kabushiki Kaisha Honda Lock. Steering lock for vehicles. 3,940,958, Cl. 70-186.000.

Kurtz, Bruce E.; and Omelian, Anatoli, to Allied Chemical Corporation. Apparatus for the production of ethylene dichloride. 3,941,568, Cl. 23-260.000.

Kurtz, Stewart K.: *See—*
Dougherty, Joseph Patrick; Kurtz, Stewart K.; and Seymour, Robert John, 3,941,478.

Kurumada, Tomoyuki: *See—*
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Toda, Toshimasa; Mori, Eiko; Horiuchi, Hideo; Higashida, Susumu; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohata, Noriyuki; and Ohsawa, Hisayou, 3,941,744.

Kushmaul, Richard T.: *See—*
Balko, Jack E.; Blair, John E.; Bybee, Jerry L.; Fuhrmeister, William F.; and Kushmaul, Richard T., 3,942,153.

Kutay, Robert Stephen; and Laughman, Kenneth Wentz, to RCA Corporation. Gas laser tube with stray light restriction. 3,942,133, Cl. 331-94.50C.

Kutkus, Leonardas, to General Motors Corporation. Rotary engine assembly. 3,941,526, Cl. 418-149.000.

Kuwabara, Motosuke: *See—*
Moriyama, Hiromi; Kuwabara, Motosuke; Jin, Katsuyuki; and Tsuruda, Tadao, 3,941,952.

Kuwana, Kazutaka, to Ainin Seiki Kabushiki Kaisha. Brake control system for vehicles. 3,941,429, Cl. 303-21.00F.

Kuzmenko, Valentin Timofeevich: *See—*
Konstantinov, Alexei Kirillovich; Volkov, Vladimir Vasilievich; Gaschenko, Viktor Petrovich; Lukashkov, Igor Vladimirovich; Klitsov, Alexandr Abramovich; and Kuzmenko, Valentin Timofeevich, 3,940,813.

Kuznetsov, Sergei Ivanovich: *See—*
Romanenko, Vitaly Ivanovich; Kuznetsov, Sergei Ivanovich; and Korenkov, Vladimir Nikolaevich, 3,941,691.

L. Schuler GmbH: *See—*
Rasenberger, Otto, 3,941,240.

La Telemecanique Electrique: *See—*
Contal, Maurice, 3,942,144.
Lacan, Guy, 3,941,445.

Labbe, Francis Auguste Maurice: *See—*
Molins, Desmond Walter; and Labbe, Francis Auguste Maurice, 3,941,036.

La Belle, Robert, to General Instrument Corporation. Purity adjusting device for slotted mask in-line color picture tubes. 3,942,146, Cl. 335-212.000.

Lacan, Guy, to La Telemecanique Electrique. Electrical connector device. 3,941,445, Cl. 339-64.00M.

Lacombe, Arturo Aldecoa: *See—*
Aldecoa, Ramon Zubiaga; Lacombe, Arturo Aldecoa; Carles, Jose Maria Zubiaga; Salaverri, Javier Arostegui; and Borde, Damaso Urruticoechea, 3,941,071.

Lacoste, Francois Rene, to Patentex S.A. Tennis rackets and similar implements with vibration damper. 3,941,380, Cl. 273-72.00A.

Lafontaine, Florian. Motor operated garage door mechanism. 3,942,073, Cl. 317-6.000.

Laftsidis, Stergios: *See—*
Glabe, Elmer F.; Anderson, Perry W.; Laftsidis, Stergios; and Grothus, Philip G., 3,941,893.

Lagnitre, Alain, to Societe Nouvelle de Roulements. Device for mounting spherical piston-rod ends of barrel-type hydraulic machine. 3,941,493, Cl. 403-122.000.

Laitram Corporation, The: *See—*
Lapeyre, James M., 3,941,238.

Lajovic, Dusan S. Apparatus for severing and feeding lightweight tubular plastic elements. 3,940,834, Cl. 425-403.000.

Laker, Kenneth R.; Budreau, Alan J.; and Carr, Paul H., to United States of America, Air Force. Method and means for coupling a multiplicity of surface acoustic wave transducers to a single electromagnetic wave transmission line. 3,942,140, Cl. 333-72.000.

Lalley, John J. Game. 3,941,385, Cl. 273-131.0BB.

Lamarre, Jean-Michel, to Agence Nationale de Valorisation de la Recherche (ANVAR). Method and apparatus for recording and/or indicating in quantified form a function of two variables. 3,941,991, Cl. 235-197.000.

Lambert Anodizing Co., Inc.: *See—*
Lambert, Raymond E., 3,941,461.

Lambert, Raymond E., to Lambert Anodizing Co., Inc. Hinge attached to the split ends means for aligning an eyeglass frame at the split ends thereof and also the front. 3,941,461, Cl. 351-95.000.

Lameris, Sophia Adriana; van Os, Jan Lambert; and Oostendorp, Joannes Gerard, to Gist-Brocades N.V. Method for determination of the presence of antibiotics. 3,941,658, Cl. 195-103.50R.

Lance Engineering Co., Inc.: *See—*
Ambrose, Robert; and Noll, Lewis H., 3,940,932.

Landry, Raymond H.: *See—*
Colby, Harold S.; and Landry, Raymond H., 3,940,844.

Landstorfer, Fritz: *See—*
Meinke, Hans Heinrich; Lindenmeier, Heinz; Landstorfer, Fritz; and Flachenecker, Gerhard, 3,942,119.

Lapeyre, James M. Automatic glass washer and chiller dispenser. 3,940,944, Cl. 62-322.000.

Lapeyre, James M., to Laitram Corporation, The. Integral hinged food conveyor belt construction with levitation means. 3,941,238, Cl. 198-184.000.

Lapidot, Heine, to General Electric Company. Proportional fluid sampling device. 3,940,993, Cl. 73-421.00B.

Lapp, Otto: *See—*
Ranz, Erwin; Lapp, Otto; Moisar, Erik; and von Rintelen, Harald, 3,941,595.

Larkin, John M., to Texaco Inc. Preparation of nitrocarbonyl compounds. 3,941,846, Cl. 260-593.00R.

Larrabee, Robert Dean, to RCA Corporation. Method of fabricating a charged couple radiation sensing device. 3,941,630, Cl. 156-13.000.

LaSarge, Eugene A., to Lear Siegler, Inc. Gimbal control mechanism. 3,941,001, Cl. 74-5.200.

Lasher, David C.: *See—*
Liechty, Karl E.; and Lasher, David C., 3,941,376.

La Spina, Andrea: *See—*
Wiedermann, Rolf; and La Spina, Andrea, 3,941,726.

Lasswell, Joseph Arnold: *See—*
Roth, Clarence Edward, Jr.; Lasswell, Joseph Arnold; Bybee, William Dennis; and Parker, Earl Brewer, Jr., 3,941,747.

Laude, Jean Pierre; and Pieuchard, Guy, to Jobin-Yvon. Piezoelectrically driven optical grating assemblies. 3,942,048, Cl. 310-8.100.

Laughman, Kenneth Wentz: *See—*
Kutay, Robert Stephen; and Laughman, Kenneth Wentz, 3,942,133.

Lauhoff, Theodor; Quante, Manfred; Stickel, Kurt Erwin; Bolz, Egon; and Semma, Klaus, to Interatom, Internationale Atomreaktorbau GmbH. Method and device for remotely monitoring electrically conductive liquids. 3,940,996, Cl. 73-432.00R.

Lauridsen, Walter E.: *See—*
Anderson, A. D.; Lauridsen, Walter E.; and Overstreet, Charles L., 3,940,830.

Lautenschlaeger, Karl, to Karl Lautenschlager KG Mobelbeschlaegfabrik. Snap hinge. 3,940,828, Cl. 16-163.000.

La White, Eric L.; Henrichon, Ernest G., Jr.; and Bloom, Harvey J., to Xicon Data Entry Corporation. Paper transporter. 3,941,375, Cl. 271-251.000.

Lawless, Earl E. Shield for fish hooks and similar barbed hook-like members. 3,940,873, Cl. 43-57.50R.

Lawlor, Francis Daniel, to International Business Machines Corporation. System for packing page frames with segments. 3,942,155, Cl. 340-172.500.

Lawrence, Jackson: *See—*
Troope, Walter S.; and Lawrence, Jackson, 3,940,833.

Lawrence Peska Associates, Inc.: *See—*
Britt, Russell, 3,941,049.

Lawson, Robert Crawford; Porter, David; and Hannan, William James, to National Research Development Corporation. Composite fission dosemeter for fast neutrons. 3,942,013, Cl. 250-391.000.

Layman, H. David: *See—*
Mathers, James E.; Yale, Ramon L.; and Layman, H. David, 3,941,714.

Lear Siegler, Inc.: *See—*
LaSarge, Eugene A., 3,941,001.

Leatherman, Alfred F.: *See—*
Heller, William C., Jr.; and Leatherman, Alfred F., 3,941,641.

Lebailly, Jacques, to U.S. Philips Corporation. Polychromatic electroluminescent device. 3,942,185, Cl. 357-17.000.

Lech, Joseph Martin: *See—*
Haugsjaa, Paul Osborne; McNeill, William Henry; Regan, Robert James; and Lech, Joseph Martin, 3,942,068.

Lechner, Walter, to Messrs. STELCO Speilwarenfabrik Stelter GmbH & Co. KG. Clockwork motor, especially for toys. 3,941,212, Cl. 185-37.000.

Leckband, Lee M.; and Taatjes, Steven W., to FMC Corporation. Method of and apparatus for forming packages. 3,940,906, Cl. 53-29.000.

Leclercq, Alain: *See—*
Vedda, Louis; and Leclercq, Alain, 3,941,183.

Leconte, Gilles, to Regie Nationale des Usines Renault. Anti-spinning device for automobiles. 3,941,203, Cl. 180-105.00E.

Ledermann & Co.: *See—*
Heimbrand, Eberhard; and Bok, Peter, 3,941,173.

Le Drezen, Pierre: *See—*
Jacob, Jean-Baptiste; Renoulin, Roger; and Le Drezen, Pierre, 3,941,947.

Lee, Leonard S.; Sopp, Samuel W.; and Siegel, Howard M., to Merck & Co., Inc. Coatings for ferrous substrates. 3,941,621, Cl. 148-27.000.

Lee, Leonard S.; Uyeda, Yoshio; and Sopp, Samuel W., to Merck & Co., Inc. Coatings for ferrous substrates. 3,941,622, Cl. 148-27.000.

Lee, Richard J., to Standard Oil Company. High molecular weight aliphatic hydrocarbon sulfonic acids, sulfonyl chlorides and sulfonamides. 3,941,834, Cl. 260-504.00R.

Lee, Shaotsu Thomas. Ventilating endoscopes. 3,941,120, Cl. 128-4.000.

Leeds & Northrup Company: *See—*
Eckfeldt, Edgar L.; Proctor, William E.; and Eynon, James U., 3,941,665.

Leesona Corporation: *See—*
Bradbury, Christopher Grover; Gotham, Stanley Thomas; and Wudyka, Joseph Paul, 3,941,684.

LeFever, Stanton Brenneman; and Matrisian, Robert Michael, to Du Pont de Nemours, E. I., and Company. Apparatus and process for applying contact dots. 3,941,969, Cl. 219-68.000.

Leger, Donald Roy: *See—*
Perrotti, Emmanual J.; and Leger, Donald Roy, 3,940,858.

Leibenzon, Mikhail Grigorievich: *See—*
Andreev, Sergei Vasilievich; Leibenzon, Mikhail Grigorievich; Trushin, Jury Petrovich; and Luzgin, Mikhail Sergeevich, 3,941,089.

Leiboff, Teague N., to Northrop Corporation. Simplified multi-channel data sensor system. 3,941,924, Cl. 178-6.800.

Lenaghan, Arlene. Interconnected surgical sponges. 3,941,132, Cl. 128-296.000.

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Figge, Erwin E.; Hapke, Kenyon A.; Karalus, George C.; and Lenell, Robert C., 3,941,465.

Lenker, Paul E.; and Voss, Raymond G., to Davenport Tool Co. Plier type ratchet wrench. 3,941,017, Cl. 81-57.390.

Leonhardt, Horst M. Side lasting apparatus. 3,940,816, Cl. 12-7.000.

Lerner, Julius, to Sun Oil Company of Pennsylvania. Control valve drive. 3,941,148, Cl. 137-486.000.

Leung, Yam C.: *See—*
Voross, Zoltan; Caruth, James R.; and Leung, Yam C., 3,940,977.

Levack, Walter R. Anti-clamping suction head for sweeping swimming pools. 3,940,817, Cl. 15-1.700.

Lever Brothers Company: *See—*
Dawson, Peter Leonard; Rickard, Michael David; and Rothwell, Michael Tom, 3,941,713.
Gilbert, Allan H.; and Kinsman, Donald V., 3,941,710.
Jorgensen, Arne, 3,941,301.

Li, Tao P.: *See—*
Franz, Raymond A.; Madding, Gary D.; and Li, Tao P., 3,941,854.

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Kaffenberger, Ernst, 3,942,141.

Lie, Hakon. Apparatus for simulated skiing. 3,941,377, Cl. 272-57.00B.

Liechty, Karl E.; and Lasher, David C., to Xerox Corporation. Automatic document handler. 3,941,376, Cl. 271-275.000.

Liede, Dieter: *See—*
Moser, Theo; and Liede, Dieter, 3,941,248.

Lieske, Manfred: *See—*
Olsen, Willi; Lieske, Manfred; Ehmann, Wolfgang; Krause, Dieter; and Perst, Gerhard, 3,942,030.

Liljenwall, Edward T.: *See—*
Misson, William W.; Studley, Clarence K.; West, William J.; and Liljenwall, Edward T., 3,941,953.

Limberg, Allen LeRoy, to RCA Corporation. Low output impedance voltage divider network. 3,942,046, Cl. 307-297.000.

Limburg, William W., to Xerox Corporation. Polyvinylpyrenal—an intrinsic photoconductor and active matrix polymer. 3,941,750, Cl. 260-73.00R.

Limpens, Karl: *See—*
Glindmeyer, Friedrich; Hennenberg, Wilhelm Friedrich; and Limpens, Karl, 3,941,163.

Lindbergh, Charles. Self-erecting aircraft structure. 3,940,892, Cl. 52-86.000.

Lindemann, Martin K., to Chas. S. Tanner Co. Aqueous emulsion adhesive of a copolymer of an alcohol ether of N-methylol derivative of an allyl carbamate which develops water resistance through cure. 3,941,735, Cl. 260-29.6WB.

Lindenmeier, Heinz: *See—*
Meinke, Hans Heinrich; Lindenmeier, Heinz; Landstorfer, Fritz; and Flachenecker, Gerhard, 3,942,119.

Lindley, John P.: *See—*
Crumly, Charles B.; and Lindley, John P., 3,942,109.

Linforth, William J.: *See—*
Doe, Ewart H.; and Linforth, William J., 3,941,256.

Lipinski, Christopher Andrew, to Pfizer Inc. 5-(Substituted phenoxy)-4-amino pyrimidines as anti-ulcer agents. 3,941,889, Cl. 424-251.000.

Lippert, Gerhard: *See—*
Vollheim, Gerhard; Troger, Karl-Jurgen; and Lippert, Gerhard, 3,941,717.

Liska, Manfred; and Grunleitner, Johann, to Siemens Aktiengesellschaft. Winding and re-winding apparatus using a D.C. motor with an electronic commutation device. 3,942,081, Cl. 318-7.000.

Liska, Manfred: *See—*
Kristen, Reiner; and Liska, Manfred, 3,942,054.

Litster, John: *See—*
Graham, Keith; Korsky, Viacheslav; Elmer, Christopher; Pinede, Edouard; Litster, John; and Aarts, Jan, 3,941,936.

Llona, Jose Luis Gomex: *See—*
Peral, Juan Jose Zubeldia; and Llona, Jose Luis Gomex, 3,942,166.

LNIH, Inc.: *See—*
Kanor, Steven E., 3,941,317.

Lobello, John; and Allen, George W., to Eastern Company, The. Mine roof expansion anchor. 3,941,028, Cl. 85-73.000.

Lockheed Aircraft Corporation: *See—*
Gibson, Harry S., Jr.; and Rogers, Stephen C., Jr., 3,941,027.

Loeble, William D.: *See—*
McCabe, James L.; and Loeble, William D., 3,941,162.

Lohse, Paul, to Arnold & Richter KG, Firma. Film pull-down mechanism. 3,941,287, Cl. 226-57.000.

Lonza Ltd.: *See—*
Greth, Erich, 3,941,786.

Louis, Joseph E.; and Cannell, Roger D., to Sundstrand Corporation. Torque limiting control. 3,941,514, Cl. 417-216.000.

Louth, Kenneth, to International Video Corporation. Video tape recorder method and apparatus. 3,942,084, Cl. 318-138.000.

Love, Ronald Barr; and Stewart, Alistair Templeton, to J & P Coats Limited. Method of producing dyed material. 3,941,561, Cl. 8-92.000.

Lowder, Dale E.: *See—*
Phillips, Paul E.; Nise, Wilfred C.; Hommes, Jack L.; and Lowder, Dale E., 3,940,826.

Lowther, Frank Eugene, to W. R. Grace & Co. Multiple corona generator system. 3,942,093, Cl. 321-45.00R.

Lozier, Robert E., Jr.: *See—*
Simpson, John R.; and Lozier, Robert E., Jr., 3,941,178.

Lubimov, Eugene J.: *See—*
Dietrich, Joseph W.; and Lubimov, Eugene J., 3,941,126.

Lubrizol Corporation, The: *See—*
Coleman, Lester Earl, 3,941,836.

Luck, Clarence F., Jr.; and Bowness, Colin, to Raytheon Company. Laser material removal apparatus. 3,941,973, Cl. 219-121.00L.

Luckhurst, Geoffrey Arthur: *See—*
Dorey, Howard Anthony; and Luckhurst, Geoffrey Arthur, 3,942,174.

Lukashkov, Igor Vladimirovich: *See—*
Konstantinov, Alexei Kirillovich; Volkov, Vladimir Vasilievich; Gaschenko, Viktor Petrovich; Lukashkov, Igor Vladimirovich; Klitsov, Alexandr Abramovich; and Kuzmenko, Valentin Timofeevich, 3,940,813.

Lukes, Donald J., to Crane Packing Company. No-leak double rotary mechanical seal. 3,941,394, Cl. 277-40.000.

Luther, William: *See—*
Rannou, Jean; and Luther, William, 3,942,180.

Luzgin, Mikhail Sergeevich: *See—*
Andreev, Sergei Vasilievich; Leibenzon, Mikhail Grigorievich; Trushin, Jury Petrovich; and Luzgin, Mikhail Sergeevich, 3,941,089.

Lynes, Inc.: *See—*
Conover, George E., deceased, 3,941,190.

Maassen, Dieter; Nast, Roland; Bormann, Heinrich; Piechota, Helmut; and Kraft, Karl-Josef, to Bayer Aktiengesellschaft. Process for the preparation of saccharose-hydroxy alkyl ethers. 3,941,769, Cl. 260-209.00R.

Mabuchi, Kenichi, to Mabuchi Motor Co. Ltd. Motor-driven model airplane having a pusher propeller. 3,940,882, Cl. 46-243.0AV.

Mabuchi, Kenichi. Battery cassette and apparatus thereof. 3,941,618, Cl. 136-173.000.

Mabuchi Motor Co. Ltd.: *See—*
Mabuchi, Kenichi, 3,940,882.

MacGregor, Fred M., Jr., to Carter-Wallace, Inc. Puck for and method of magnetic conveying. 3,941,237, Cl. 198-41.000.

Machefert-Tassin, Yves, to Societe M.T.E. Electromagnetic system for transversely aligning railway rolling stock on rails. 3,941,062, Cl. 105-157.00R.

Machi, Sueo; Suwa, Takeshi; Takehisa, Masaaki; and Seguchi, Tadao, to Japan Atomic Energy Research Institute. Stable dispersion of high molecular weight polytetrafluoroethylene containing no additives and a process for the production thereof. 3,941,671, Cl. 204-159.220.

MacInnes, Hugh; and Uitti, Paul M., to Rajay Industries, Inc. Bearing housing for high speed rotating shafts. 3,941,437, Cl. 308-121.000.

Mack, Peter Albert: *See—*
Ackerley, Norman; and Mack, Peter Albert, 3,941,793.

Macken, Elmer Nelson, to Olin Corporation. Adjustable electrode. 3,941,676, Cl. 204-266.000.

MacLean-Fogg Lock Nut Company: *See—*
Shiber, Samuel, 3,941,225.

MacMaster, George H.; and Dudley, Kenneth W., to Raytheon Company. Microwave browning plate. 3,941,968, Cl. 219-10.55E.

Madden, Richard A. Device for continuously measuring a dimension of a workpiece by reflected light. 3,941,485, Cl. 356-159.000.

Madding, Gary D.: *See—*
Franz, Raymond A.; Madding, Gary D.; and Li, Tao P., 3,941,854.

Madsen, Hans Berg; Holst, Preben Lindholm; and Solli, Houk, to A/S Cheminova. Compounds having juvenile hormone activity. 3,941,777, Cl. 260-240.00H.

Maezawa, Shuji, to Kabushiki Kaisha Suwa Seikosha. Display device with oriented liquid crystals. 3,941,454, Cl. 350-160.0LC.

Maier, Richard J.: *See—*
Carmichael, Thomas F.; and Maier, Richard J., 3,941,111.

Maillefer, Charles E.; and Schlaeppi, Rene, to Maillefer S.A. Winding apparatus. 3,941,329, Cl. 242-80.000.

Maillefer, Henri, to Maillefer S.A. Machine for alternate twisting of wire or cable. 3,941,166, Cl. 140-149.000.

Maillefer S.A.: *See—*
Maillefer, Charles E.; and Schlaeppi, Rene, 3,941,329.
Maillefer, Henri, 3,941,166.

Maisch, Wolfgang; and Rubel, Erich, to Robert Bosch G.m.b.H. Track system for steered, untrack vehicles. 3,942,087, Cl. 318-587.000.

Majima, Hideji: *See—*
Sato, Masao; and Majima, Hideji, 3,941,022.

Malden, Peter James. Coating of paper with resin-treated silicates. 3,941,794, Cl. 260-29.2EP.

Malone, Harold Lee: *See—*
Hargrave, Jerry Lee; and Malone, Harold Lee, 3,941,447.

Malott, Thomas J., to Parker-Hannifin Corporation. Variable displacement pump control assembly. 3,941,513, Cl. 417-212.000.

Malta, Jacob H. Handbell. 3,941,082, Cl. 116-171.000.

Mann, Fred W. Combination insecticide applicator and feeder. 3,941,096, Cl. 119-159.000.

Manning, Monis J., to Polaroid Corporation. Application of protective polymer to processed diffusion transfer light sensitive element. 3,941,597, Cl. 96-29.00R.

Maran, Richard I.; and Meijer, Robert S., to Multi-State Devices Ltd. Semi-conductor thermal protection arrangement. 3,942,075, Cl. 317-41.000.

Marchenko, Alexandr Mikhailovich: *See—*
Bondarenko, Oleg Petrovich; Medovar, Boris Izrailevich; Podola, Nikolai Vasilievich; Kravchuk, Anatoly Iosifovich; Marchenko, Alexandr Mikhailovich; Baglai, Vitaly Mikhailovich; Vernik, Alexandr Borisovich; Kamensky, Leonid Alexeevich; Us, Vasily Ivanovich; Mokhnach, Vladislav Konstantinovich; and Andrianov, Georgy Grigorievich, 3,942,105.

Marinkovich, Vincent A., to GTE New Ventures Corporation. In vitro method for determining allergic hypersensitivity. 3,941,876, Cl. 424-1.000.

Marion, George J. Apparatus using solid insulating material as a center plate between multiple flat extrusion streams. 3,941,550, Cl. 425-463.000.
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Marlin & Company Systems Engineers Inc.: *See*—
McVittie, Thomas J., 3,941,468.
Marolewski, Theodore A.: *See*—
Gentit, William F.; and Marolewski, Theodore A., 3,941,708.
Maroschak, Ernest J. Tube doffing and bundling method. 3,941,639, Cl. 156-207.000.
Marosi, Laszlo: *See*—
Broecker, Franz Josef; Zirker, Guenter; Triebskorn, Bruno; Marosi, Laszlo; Schwarzmann, Matthias; Dethlefsen, Winfried; and Kaempfer, Knut, 3,941,721.
Marosvolgyi, Sandor: *See*—
Grega, Erzsebet; Gribovszky, Pal; Marosvolgyi, Sandor; Pinter, Zoltan; Szilagyi, Gyula; Szita, Istvan; Tarr, Csaba; and Tasi, Laszlo, 3,941,783.
Marotta Scientific Controls, Inc.: *See*—
Worden, Donald A., 3,941,508.
Martin, Allan E.: *See*—
Steunenberg, Robert K.; Martin, Allan E.; and Tomczuk, Zygmunt, 3,941,612.
Martin, Anwyn Margaret; Stewart, Donald Fergusson; and Swanson, Andrew Baikie, to ICI Australia Limited. Ilmenite coated pellet and process for reducing same. 3,941,583, Cl. 75-4.000.
Martin, Elmore Louis, to Du Pont de Nemours, E. I., and Company. (Cyano-dialkylphenyl) alkyl sulfides, sulfoxides and sulfones. 3,941,826, Cl. 260-465.00R.
Martin, John; and Osorio, Enrique Peyrani, to Fabricacion de Maquinas. Sheet glass - conveying, classifying and stacking apparatus. 3,941,370, Cl. 271-64.000.
Martin, John K., to Fabricacion de Maquinas. Sheet glass conveying, classifying & stacking apparatus. 3,941,371, Cl. 271-64.000.
Martindale, Troy E., to B. F. Goodrich Company, The. Cold branding apparatus for vulcanized tires. 3,941,050, Cl. 101-11.000.
Marvin Glass & Associates: *See*—
Kaelin, Bette M.; and Terzian, Rouben T., 3,940,880.
Masaki, Tatsuo: *See*—
Hanada, Hiroshi; Kitajima, Nobuo; and Masaki, Tatsuo, 3,941,591.
Maschi, Francesco: *See*—
Vicentini, Arnaldo; Maschi, Francesco; and Arrigoni, Guido, 3,941,935.
Maskal, John; Thompson, Ivan M.; and Heikel, Henrik R., to Dow Chemical Company, The. Magnesium hydroxide-containing paper. 3,941,610, Cl. 106-308.00M.
Maslowski, Stefan: *See*—
Borner, Manfred; Glasmachers, Gisbert; Bernecker, Otto; Riemann, Volker; and Maslowski, Stefan, 3,941,945.
Mason, Stanley I., Jr., to Simco, Inc. Moisture retainable soil covering with integral fertilizing capabilities. 3,940,884, Cl. 47-32.000.
Mason, William H., to United States of America, Health, Education and Welfare. Method and apparatus for continuous mixing of blood plasma and additives. 3,941,356, Cl. 259-7.000.
Massachusetts Institute of Technology: *See*—
Baker, Richard H., 3,942,028.
Pratt, George W., Jr., 3,941,670.
Ward, John E.; Silvey, John O.; and Roberge, James K., 3,940,979.
Massar, Ernst: *See*—
Abolins, Arnold; Massar, Ernst; and Weghaupt, Erich, 3,942,053.
Massung, Patrick. Fluid pressure-gravity motor. 3,941,030, Cl. 91-4.00R.
Mastandrea, John R.: *See*—
Covey, William B.; Mastandrea, John R.; and Teng, Robert N., 3,940,981.
Masuda, Takashi; Sozaki, Shigeyuki; Ando, Masakatsu; and Oumi, Hideo, to Mitsubishi Belting Limited. Method of manufacturing a conveyor belt and an apparatus therefor. 3,941,637, Cl. 156-179.000.
Mate, David J.: *See*—
Brand, John R.; and Mate, David J., 3,941,024.
Matheny, Coy Edwin, to International Telephone and Telegraph Corporation. Privacy circuit for key telephone systems. 3,941,943, Cl. 179-99.000.
Mathers, James E.; Yale, Ramon L.; and Layman, H. David, to GTE Sylvania Incorporated. Process for reclaiming rare earth oxysulfide phosphors. 3,941,714, Cl. 252-301.40S.
Matoba, Kazuo: *See*—
Takao, Hiroshi; Togawa, Kinmochi; Matoba, Kazuo; and Hata, Yoshitaka, 3,941,673.
Matos, Herbert: *See*—
Glasser, George Marvin; and Matos, Herbert, 3,941,892.
Matrisian, Robert Michael: *See*—
LeFever, Stanton Brenneman; and Matrisian, Robert Michael, 3,941,969.
Matsuda, Atsushi: *See*—
Kawakami, Hirotake; Matsuda, Atsushi; and Takahashi, Kazumasa, 3,941,946.
Matsui, Katsuaki: *See*—
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Toda, Toshimasa; Mori, Eiko; Horiuchi, Hideo; Higashida, Susumu; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohata, Noriyuki; and Ohsawa, Hisayou, 3,941,744.
Matsumoto, Kazuo: *See*—
Oishi, Masanori; Koyanagi, Harusige; and Matsumoto, Kazuo, 3,941,914.
Matsumoto, Kojiro: *See*—
Tajima, Shigeru; Shimamura, Takeshi; Matsumoto, Kojiro; Sekiguchi, Sadao; Yamagoshi, Tanoshi; and Fjieda, Kazumasa, 3,941,912.
Matsumoto, Yoshio: *See*—
Okamoto, Keiichi; Matsumoto, Yoshio; and Oshima, Yasujiro, 3,941,980.
Matsumura, Hiroyoshi: *See*—
Kitano, Ichiro; Koizumi, Ken; and Matsumura, Hiroyoshi, 3,941,474.
Matsumura, Shoichi: *See*—
Wakabayashi, Hiroshi; Nakagawa, Toru; Matsumura, Shoichi; and Fujii, Shigeru, 3,941,757.
Matsuo, Masaharu. Feeding apparatus for corrugated cardboard sheets. 3,941,372, Cl. 271-95.000.
Matsushita Electric Industrial Co., Ltd.: *See*—
Detwiler, Barry C., 3,942,190.
Kawamoto, Kinji, 3,941,025.
Murakami, Mutsuaki, 3,941,792.
Nakamura, Shoichi; Inui, Toshiaki; and Horiike, Yoshio, 3,940,920.
Nishioka, Matsuo, 3,942,148.
Ohmiya, Shoji; and Yoshimatsu, Toshio, 3,941,391.
Tanabe, Kenzo; and Mino, Mineo, 3,942,188.
Todoroki, Tsunehiko; and Shida, Sankichi, 3,940,964.
Tsuchiya, Hiroyoshi; Yoshida, Kunio; Tsuda, Yukifumi; Hayami, Heijiro; and Kotera, Hiroaki, 3,941,922.
Matsuura, Takashi. Multi-staged automobile parking apparatus. 3,941,257, Cl. 214-16.1ED.
Matthes, Hans; and Mauler, Erhard, to AEG-Elotherm G.m.b.H. Control process for operating a parallel-resonant circuit inverter that supplies an inductive charge, as well as the parallel-resonant circuit inverter operated by this method. 3,942,090, Cl. 321-4.000.
Matuck, George Coleman; Sienkiewicz, Gerald Carl; and Thorne, William Duncan, to International Business Machines Corporation. Ribbon cartridge. 3,941,231, Cl. 197-151.000.
Matula, Jerry, to Bell & Howell Company. Rotational position sensor. 3,941,332, Cl. 242-189.000.
Matusiak, Ronald J.: *See*—
Terral, Leonard G.; Regelson, Ephraim; Sake, William E.; Matusiak, Ronald J.; and Rea, William L., 3,940,970.
Maul, James J.; and Carlson, Richard D., to Hooker Chemicals & Plastics Corporation. Halogen containing fire retardant additive with improved heat stability. 3,941,758, Cl. 260-880.00R.
Mauler, Erhard: *See*—
Matthes, Hans; and Mauler, Erhard, 3,942,090.
Maulini, Maurizio, to Azionaria Costruzioni Macchine Automatiche A.C.M.A. S.p.A. Feeder for packaging. 3,941,170, Cl. 141-183.000.
Maurhoff, Gerhard; and Steinwart, Johannes, to Audi NSU Auto Union Aktiengesellschaft. Internal combustion engine having a reactor for afterburning of unburned- exhaust gas constituents. 3,940,927, Cl. 60-282.000.
Maurhoff, Gerhard: *See*—
Wilmers, Gottlieb; and Maurhoff, Gerhard, 3,941,525.
Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V.: *See*—
Mundt, Paul Gerhard; Modolell, Manuel; and Wallach, Donald Francis Hoelzl, 3,941,662.
Maxey, Robert E. L., to Westinghouse Electric Corporation. Three axis precision measuring device. 3,940,854, Cl. 33-174.00L.
Maxwell, David. Marker/anti-marker system. 3,941,488, Cl. 401-17.000.
Mayer, Donald K., to Westinghouse Electric Corporation. Dual drive mechanism. 3,941,012, Cl. 74-661.000.
Maynard, John T.: *See*—
Young, Christopher; and Maynard, John T., 3,941,214.
Mazarguil, Honore; Meiller, Francois; and Monsan, Pierre, to Rhone-Poulenc Industries. Purification of d-aminoacid oxidase. 3,941,657, Cl. 195-66.00R.
McAvoy, Bruce R.; and Driver, Michael C., to Westinghouse Electric Corporation. High frequency, field-effect transistor. 3,942,186, Cl. 357-22.000.
McCabe, James L.; and Loeble, William D., to Uniroyal Inc. Reinforcing fabric for belts. 3,941,162, Cl. 139-383.00R.
McCarty, William J., to General Electric Company. Mounting arrangement for fan motor. 3,941,339, Cl. 248-15.000.
McCauley, Herbert J. Pump. 3,941,519, Cl. 417-560.000.
McClintock, Richard D. Immersion responsive sensor. 3,942,167, Cl. 340-244.00C.
McCloskey, Albert R., to Rockwell International Corporation. Method of manufacturing a spherical bearing. 3,940,836, Cl. 29-149.50C.
McCloskey, Edward W. Irrigation signalling device. 3,941,078, Cl. 116-118.00A.
McCollum, Robert F.; Jones, Robert J.; and Deck, Philip E., to Telex/-Computer Products, Inc. Tape reel positioning and latching means. 3,941,327, Cl. 242-68.300.
McDonald, Maxwell Wilson, to Golden M Enterprises, Inc. Apparatus for piercing earlobes. 3,941,134, Cl. 128-330.000.
McDonnell Douglas Corporation: *See*—
Covey, William B.; Mastandrea, John R.; and Teng, Robert N., 3,940,981.
Moor, Clinton H.; Stolwyk, Carl F.; and Vencill, John J., 3,942,135.

McDowall, William Leslie, to Dunlop Australia Limited. Battery construction. 3,941,615, Cl. 136-38.000.

McDowell, William P.; and Bobis, James P., to United States of America, Energy Research and Development Administration. Logic elements for reactor period meter. 3,942,014, Cl. 250-392.000.

McFarland, Philip J.; and Rambauske, Werner R., to Raytheon Company. Catoptric lens arrangement. 3,941,459, Cl. 350-294.000.

McFarland, Philip J.: *See—*
Merrow, Earle F.; Rambauske, Werner R.; and McFarland, Philip J., 3,941,458.

McFeeters, Robert D.: *See—*
Durham, Donald F.; and McFeeters, Robert D., 3,940,938.

McGuire, John V.; and Mitchell, Robert L., to Xerox Corporation. Method for making a covered book. 3,940,904, Cl. 53-3.000.

McIntosh, Alexander C. Signalling device for key telephone systems. 3,941,944, Cl. 179-99.000.

McKee, John M., Jr., to United States of America, Energy Research and Development Administration. Method and apparatus for regenerating cold traps within liquid-metal systems. 3,941,586, Cl. 75-66.000.

McKinney, Lynn B.; and Ortiz, Gary R., to Van Dorn Company. Embossed can end construction. 3,941,277, Cl. 220-273.000.

McLaren, Ashley Brooks: *See—*
Ekstrom, Alfred; and McLaren, Ashley Brooks, 3,941,870.

McLaughlin, Donald L.; and Streiber, Ronald W., to MOS Technology, Inc. Reducing power consumption in calculators. 3,941,989, Cl. 235-156.000.

McLaughlin, Hollis G., to Kaiser Aluminum & Chemical Corporation. Cryogenic transport. 3,941,272, Cl. 220-9.0LG.

McLean, Reuben Fraser. Apparatus for discharging materials from hoppers. 3,941,284, Cl. 222-202.000.

McMackin, Raymond F.; Britton, Richard B.; and Robins, Kenneth E. Hydraulic powered handwasher. 3,940,819, Cl. 15-21.00C.

McNeely, Charles D., to Nepro, Inc. Heating unit. 3,941,311, Cl. 237-16.000.

McNeill, John. Emergency locating device. 3,941,079, Cl. 116-124.00B.

McNeill, William Henry: *See—*
Haugsjaa, Paul Osborne; Nelson, William F.; Regan, Robert James; and McNeill, William Henry, 3,942,058.
Haugsjaa, Paul Osborne; McNeill, William Henry; Regan, Robert James; and Lech, Joseph Martin, 3,942,068.

McVittie, Thomas J., to Marlin & Company Systems Engineers Inc. Identification structure, means for, and method of production. 3,941,468, Cl. 355-3.00R.

Medgebow, Irving; and White, Gene, to Jackson Products Company. Welding jig. 3,941,295, Cl. 228-44.10R.

Medovar, Boris Izrailevich: *See—*
Bondarenko, Oleg Petrovich; Medovar, Boris Izrailevich; Podola, Nikolai Vasilievich; Kravchuk, Anatoly Iosifovich; Marchenko, Alexandr Mikhailovich; Baglai, Vitaly Mikhailovich; Vernik, Alexandr Borisovich; Kamensky, Leonid Alexeevich; Us, Vasily Ivanovich; Mokhnach, Vladislav Konstantinovich; and Andrianov, Georgy Grigorievich, 3,942,105.

Meginnis, Charles E. Quick-opening sight glass assembly. 3,941,460, Cl. 350-319.000.

Meijer, Robert S.: *See—*
Maran, Richard I.; and Meijer, Robert S., 3,942,075.

Meiller, Francois: *See—*
Mazarguil, Honore; Meiller, Francois; and Monsan, Pierre, 3,941,657.

Meinholdt, John W. Shearing apparatus. 3,941,021, Cl. 83-604.000.

Meinke, Hans Heinrich; Lindenmeier, Heinz; Landstorfer, Fritz; and Flachenecker, Gerhard, to Hans Kolbe & Co. Multiple-transmission-channel active antenna arrangement. 3,942,119, Cl. 325-308.000.

Meinunger, Helmut, to Kurbi & Niggeloh. Tripod with adjustable, polygonal, telescoping legs. 3,941,492, Cl. 403-104.000.

Meliksetian, Laura Atomovna: *See—*
Melkonian, Garegin Sarkisovich; and Meliksetian, Laura Atomovna, 3,941,574.

Meline, Harry R., to MTS Systems Corporation. Extensometer support. 3,940,975, Cl. 73-103.000.

Melissa, Raymond F.: *See—*
Barrus, Gordon B.; Emenaker, Leo J.; and Melissa, Raymond F., 3,941,051.

Melkonian, Garegin Sarkisovich; and Meliksetian, Laura Atomovna. Method of preparing a glass batch for melting silicate glass. 3,941,574, Cl. 65-27.000.

Melnick, Joseph L.; and Wallis, Craig, to Baylor College of Medicine. Sterilization of holding tanks and toilet bowls by quaternary compounds. 3,941,696, Cl. 210-62.000.

Meno, Naohiko: *See—*
Uchiyama, Hisashi; Meno, Naohiko; Senjo, Teizo; and Kobayashi, Makio, 3,941,572.

Mensch, William David, Jr., to Motorola, Inc. MOS edge sensing circuit. 3,942,037, Cl. 307-232.000.

Mentrup, Anton: *See—*
Renth, Ernst-Otto; Mentrup, Anton; Schromm, Kurt; and Danneberg, Peter, 3,941,789.

Menzin, Marvin; and Robinson, Hugh A., to Peters and Company, Inc. Self-leveling dispenser. 3,941,440, Cl. 312-71.000.

Merck & Co., Inc.: *See—*
Lee, Leonard S.; Sopp, Samuel W.; and Siegel, Howard M., 3,941,621.
Lee, Leonard S.; Uyeda, Yoshio; and Sopp, Samuel W., 3,941,622.
Salce, Ludwig; and Schoenewaldt, Erwin F., 3,941,801.

Meredith, Barton L.: *See—*
Bourbeau, Frank J.; Meredith, Barton L.; and Witten, Arthur L., 3,942,092.

Merilan, Charles P.: *See—*
Sikes, John D.; and Merilan, Charles P., 3,940,943.

Merkelo, Henry, to University of Illinois Foundation, The. Optoelectronic sampling head. 3,941,998, Cl. 250-207.000.

Merrow, Earle F.; Rambauske, Werner R.; and McFarland, Philip J., to Raytheon Company. Catoptric lens arrangement. 3,941,458, Cl. 350-294.000.

Merrow Machine Company, The: *See—*
Washburn, John M., 3,941,068.

Messerschmitt-Bolkow-Blohm GmbH: *See—*
Hermann, Walter; and Kraus, Peter, 3,941,201.
Molter, Gunther; and Cerne, Gerd, 3,941,337.

Messrs. STELCO Speilwarenfabrik Stelter GmbH & Co. KG: *See—*
Lechner, Walter, 3,941,212.

Metcalf, Robert L.; Kapoor, Inder; and Hirwe, Asha, to University of Illinois Foundation, The. p,p'-Disubstituted α-trichloromethylbenzylanilines. 3,941,842, Cl. 260-570.50R.

Metzger, Jack D., to Raymond Lee Organization, Inc., The, a part interest. Plumbing test fitting. 3,941,156, Cl. 138-90.000.

Meyer, Adolf J. G.: *See—*
Semmler, Eduard O.; Guthling, Klaus; and Meyer, Adolf J. G., 3,941,055.

Meyer, Franklin, Jr. Micrometer calipers. 3,940,856, Cl. 33-178.00R.

Meyer, Robert: *See—*
Balamuth, Lewis; Rutten, Michael R.; and Meyer, Robert, 3,941,424.

Michel, Rupprecht, to Kraftwerk Union Aktiengesellschaft. Steam generator assembly for pressurized water reactors with a straight tube bundle and a partial flow preheater traversible by pressurized water. 3,941,099, Cl. 122-32.000.

Michigan Chemical Corporation: *See—*
Johnson, Robert Phillip, 3,941,827.

Midway Industries, Inc.: *See—*
Breford, Glenn H., 3,941,407.

Miele & Cie: *See—*
Kaup, Friedel; and Warnke, Heinrich, 3,941,147.

Miles Laboratories, Inc.: *See—*
Fader, Marshall Lloyd; and Schick, Lloyd Alan, 3,941,564.

Milewski, Stephen Mark, to Scott Paper Company. Method and apparatus for applying a uniform electrostatic charge to electrophotographic film. 3,942,080, Cl. 317-262.00A.

Milkovic, Miran, to General Electric Company. Analog to pulse rate converter. 3,942,110, Cl. 324-142.000.

Miller, Albert Arthur, to Wilson Miller & Co., Ltd. Compound epicyclic transmission systems. 3,941,013, Cl. 74-740.000.

Miller, Howard R.; Putchinski, Leo J., Jr.; and Vanderlei, Kenneth W., to GTE Automatic Electric Laboratories Incorporated. Method and apparatus for isolating malfunctions occurring in sender-receiver communication switching system equipment. 3,941,949, Cl. 179-175.20R.

Miller, Walter A.; Shaw, Richard G.; and King, Paul A., to Union Carbide Corporation. Extrusion of ethylene oxide resins. 3,941,865, Cl. 264-95.000.

Millerbernd, Paul A. Amphibious bus. 3,941,074, Cl. 115-1.00A.

Minami, Masana, to Tokyo Shibaura Electric Co., Ltd. Optical readout device. 3,942,159, Cl. 340-173.0LM.

Minnesota Mining and Manufacturing Company: *See—*
Busatto, Vinicio; and Franchi, Luigi, 3,941,599.
Chang, Joe H-S, 3,941,733.
Sankey, George H.; and Whiting, Keith D. E., 3,941,796.
Taylor, Allen L., 3,940,974.
Taylor, Allen L., 3,942,009.

Mino, Mineo: *See—*
Tanabe, Kenzo; and Mino, Mineo, 3,942,188.

Minolta Camera Kabushiki Kaisha: *See—*
Kawabata, Hidetoshi, 3,941,592.
Kurita, Takaji, 3,941,084.

Minter, Jerry B. Method for handling connectors. 3,940,849, Cl. 29-628.000.

Mirsky, Jeffrey. Method and apparatus for detecting micro-organisms. 3,941,660, Cl. 195-103.700.

Mississippi Chemical Corporation: *See—*
Tucker, Gerald L.; and Blanton, Elmer Ladelle, 3,941,578.

Misson, William W.; Studley, Clarence K.; West, William J.; and Liljenwall, Edward T., to Hewlett-Packard Company. Keyboard having switches with tactile feedback. 3,941,953, Cl. 200-5.00R.

Mitchell, Drury K., to Battelle Memorial Institute. Detecting abnormality. 3,940,952, Cl. 73-67.80R.

Mitchell, Jerome L.: *See—*
Werner, Edward E.; and Mitchell, Jerome L., 3,940,831.

Mitchell, Robert L.: *See—*
McGuire, John V.; and Mitchell, Robert L., 3,940,904.

Mitchell, Robert N.: *See—*
Friedline, Ernest J.; and Mitchell, Robert N., 3,940,835.

Mitsubishi Belting Limited: *See—*
Masuda, Takashi; Sozaki, Shigeyuki; Ando, Masakatsu; and Oumi, Hideo, 3,941,637.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Akamatsu, Masahiko, 3,942,094.

Mitsui Mining & Smelting Co., Ltd.: *See—*
Saitoh, Kozo; and Izumi, Sumio, 3,941,688.

Mitsui Shipbuilding and Engineering Co., Ltd.: *See—*
Saegusa, Hitoshi; and Yoshitake, Masami, 3,941,681.

Tshida, Naoyashi; Watanabe, Atsushi; and Ishii, Yukio, 3,941,115.
Mitsui Toatsu Chemicals, Incorporated: *See*—
Asano, Shiro; Yoshimura, Kiyotaka; and Hashimoto, Masao, 3,941,837.
Mittleman, Herbert, to Baxter Laboratories, Inc. Valve. 3,941,149, Cl. 137-493.100.
Mitzlaff, Michael; and Schnabel, Horst, to Hoechst Aktiengesellschaft. Process for the preparation of N-(α-alkoxyethyl)-carboxylic acid amides. 3,941,666, Cl. 204-79.000.
Miyada, Thomas Sanfran. Rotary engine. 3,940,924, Cl. 60-39.080.
Miyahara, Kingo, to Dowa Co., Ltd. Magnetic hydraulic pump. 3,941,517, Cl. 417-420.000.
Miyaoka, Tadashi. Pipe joint construction. 3,941,410, Cl. 285-321.000.
Miyasaka, Tsutomu; and Ishiyama, Akio, to Kabushiki Kaisha Suwa Seikosha. Noncircular watch case. 3,940,922, Cl. 58-90.00R.
Miyatuka, Hajime: *See*—
Honjo, Satoru; and Miyatuka, Hajime, 3,941,594.
Mo och Domsjo Aktiebolag: *See*—
Wallin, Erik Gunnar, 3,941,649.
Mobil Oil Corporation: *See*—
Dwyer, Francis G.; and Jenkins, Edwin E., 3,941,871.
Theissen, Robert J., 3,941,830.
Mochizuki, Yoshifumi: *See*—
Yasuda, Tetuya; Yoshida, Makoto; Mochizuki, Yoshifumi; and Morokawa, Shigeru, 3,940,919.
Mock, Howard C.; Isaac, Kenneth N.; Disparte, Charles P.; and Hall, Warren L., to Xerox Corporation. Indirect arithmetic control. 3,942,156, Cl. 340-172.500.
Modicon Corporation: *See*—
Powers, Howard A., 3,942,077.
Modolell, Manuel: *See*—
Munder, Paul Gerhard; Modolell, Manuel; and Wallach, Donald Francis Hoelzl, 3,941,662.
Moelants, Felix Jan: *See*—
Depoorter, Henri; and Moelants, Felix Jan, 3,941,602.
Mohri, Katsuo; Fukuda, Masaaki; Kayano, Tatsuo; and Yoshino, Takehiko, to Hitachi, Ltd.; Hitachi Electronics Co., Ltd.; and Nippon Hoso Kyokai. Receiver for a still picture broadcasting signal. 3,941,920, Cl. 178-5.80R.
Mohri, Katsuo; Watatani, Yoshizumi; Nabeyama, Hiroaki; and Yoshino, Takehiko, to Hitachi, Ltd.; and Nippon Noso Kyokai. Synchronizing signal regenerator. 3,941,930, Cl. 178-69.50R.
Moisar, Erik: *See*—
Ranz, Erwin; Lapp, Otto; Moisar, Erik; and von Rintelen, Harald, 3,941,595.
Mokhnach, Vladislav Konstantinovich: *See*—
Bondarenko, Oleg Petrovich; Medovar, Boris Izrailevich; Podola, Nikolai Vasilievich; Kravchuk, Anatoly Iosifovich; Marchenko, Alexandr Mikhailovich; Baglai, Vitaly Mikhailovich; Vernik, Alexandr Borisovich; Kamensky, Leonid Alexeevich; Us, Vasily Ivanovich; Mokhnach, Vladislav Konstantinovich; and Andrianov, Georgy Grigorievich, 3,942,105.
Molex Incorporated: *See*—
Baumanis, Bruno, 3,941,449.
Molins, Desmond Walter; and Labbe, Francis Auguste Maurice, to Molins Limited. Continuous filter rod making machines. 3,941,036, Cl. 93-1.00C.
Molins Limited: *See*—
Molins, Desmond Walter; and Labbe, Francis Auguste Maurice, 3,941,036.
Molter, Gunther; and Cerne, Gerd, to Messerschmitt-Bolkow-Biohm GmbH. Airplane stairway. 3,941,337, Cl. 244-129.00S.
Monarch Marking Systems, Inc.: *See*—
Jenkins, William A., 3,941,289.
Monroe Belgium N.V.: *See*—
Vanmunster, Richard H., 3,941,674.
Monsan, Pierre: *See*—
Mazarguil, Honore; Meiller, Francois; and Monsan, Pierre, 3,941,657.
Monsanto Company: *See*—
Chapman, Richard D.; Holmer, Donald A.; Pickett, Oscar A., Jr.; and Saunders, James H., 3,941,755.
Franz, Raymond A.; Madding, Gary D.; and Li, Tao P., 3,941,854.
Herber, John F.; Richard, William R., Jr.; and Street, Robert W., 3,941,709.
Nelson, George D.; Nissing, Kenneth J.; and Symes, William F., 3,941,784.
Montagna, Angelo A.: *See*—
Beuther, Harold; Chun, Sun W.; and Montagna, Angelo A., 3,941,683.
Moody, Jack Milton: *See*—
Cranston, George Edward; and Moody, Jack Milton, 3,941,361.
Mooney Chemicals, Inc.: *See*—
Collins, Albert V.; and Pearl, Richard E., 3,941,606.
Moor, Clinton H.; Stolwyk, Carl F.; and Vencill, John J., to McDonnell Douglas Corporation. Concatenated surface wave delay line correlator. 3,942,135, Cl. 332-11.00R.
Mooradian, Anthony. Race game apparatus. 3,941,387, Cl. 273-134.00B.
Moore Business Forms, Inc.: *See*—
Van Malderghem, Edmund G., 3,941,307.
Moore, Richard Pierpont. Liquid conditioning and settling tanks. 3,941,704, Cl. 210-528.000.
Moore, Robert M. Signal device for detecting filter condition. 3,941,077, Cl. 116-70.000.
Moore, Robert R.: *See*—
Benton, Cecil Thomas; Freter, John Maher; and Moore, Robert R., 3,940,804.
Morain, Eldon W.; and Cole, Judson C., to Continental Industries, Inc. Safety valve. 3,941,145, Cl. 137-318.000.
Moran, Fred R. Car dryer. 3,940,821, Cl. 15-97.00B.
Morgan Construction Company: *See*—
Gilvar, Martin, 3,940,961.
Vitelli, Vito J., 3,940,967.
Morgan, Thomas H. Artificial lift for oil wells. 3,941,510, Cl. 417-57.000.
Morgan, Thomas H. Artificial lift for oil wells. 3,941,511, Cl. 417-57.000.
Mori, Eiko: *See*—
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Toda, Toshimasa; Mori, Eiko; Horiuchi, Hideo; Higashida, Susumu; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohata, Noriyuki; and Ohsawa, Hisayou, 3,941,744.
Mori, Kazumasa: *See*—
Itoh, Katsumi; and Mori, Kazumasa, 3,942,096.
Itoh, Katsumi; and Mori, Kazumasa, 3,942,097.
Mori, Toshio. Plate for indicating the floors and the numbers of stairs of a building. 3,940,865, Cl. 40-134.000.
Morimura, Syoji: *See*—
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Toda, Toshimasa; Mori, Eiko; Horiuchi, Hideo; Higashida, Susumu; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohata, Noriyuki; and Ohsawa, Hisayou, 3,941,744.
Moriyama, Hiromi; Kuwabara, Motosuke; Jin, Katsuyuki; and Tsuruda, Tadao, to Hitachi, Ltd. Telephone exchange system employing means capable of breaking a connection between a terminal unit and a switch frame using mechanical latching type crossbar switches. 3,941,952, Cl. 179-18.0GE.
Morizumi, Yosihiro: *See*—
Kageyama, Takao; and Morizumi, Yosihiro, 3,942,066.
Morohashi, Hishao: *See*—
Ohno, Genji; Uchiyama, Tadamitsu; Ohki, Seisaku; and Morohashi, Hishao, 3,941,312.
Morokawa, Shigeru: *See*—
Yasuda, Tetuya; Yoshida, Makoto; Mochizuki, Yoshifumi; and Morokawa, Shigeru, 3,940,919.
Morooka, Yasuo: *See*—
Tanifuji, Shinya; Morooka, Yasuo; and Tanuma, Masaya, 3,940,960.
Morriss, James W., to Atmos Corporation. Thyristor control circuit. 3,942,041, Cl. 307-252.00M.
Morsbach, Paul. Monorail system. 3,941,060, Cl. 104-247.000.
Morse, Robert Spitler, to Burroughs Corporation. Electronic circuit package and method of brazing. 3,941,916, Cl. 174-52.0FP.
Morse, Samuel F.; and Spector, George. Flag pole. 3,941,083, Cl. 116-173.000.
MOS Technology, Inc.: *See*—
McLaughlin, Donald L.; and Streiber, Ronald W., 3,941,989.
Mose, Luciano: *See*—
Strasser, Bernd; Kramer, Wolfgang; Mose, Luciano; and Hund, Helmut, 3,941,675.
Moser, Raymond L.; and Volle, Everette Michael, to Caterpillar Tractor Co. Pivotally disposable bucket. 3,941,262, Cl. 214-145.00R.
Moser, Theo; and Liede, Dieter, to Robert Bosch Verpackungsmaschinen G.m.b.H. Childproof packaging for tablets. 3,941,248, Cl. 206-531.000.
Mosler Safe Company, The: *See*—
Voss, Robert H.; Ward, Earl M.; and Spetz, William L., 3,941,977.
Moss, Gerald; and Taylor, James Howard, to United States of America, Environmental Protection Agency. Nozzle assembly for distributing fluid. 3,941,314, Cl. 239-553.300.
Motoren-und Turbinen-Union Friedrichshafen GmbH: *See*—
Seifert, Richard, 3,941,114.
Motorola, Inc.: *See*—
Buchanan, John K., 3,942,047.
Buchanan, John K., 3,942,162.
Grenon, Lawrence A., 3,940,846.
Mensch, William David, Jr., 3,942,037.
Nash, Harold G., 3,941,942.
Russ, Malcolm J., 3,942,065.
Swiatowiec, Frank J.; and Rao, Ramachandra A., 3,942,033.
Yu, Robert Tapei, 3,942,160.
Mott, James D., to Hydril Company. Safety valve. 3,941,348, Cl. 251-58.000.
Mouzin, M. Gilbert: *See*—
Stenger, M. Antoine; Cousse, Henri; and Mouzin, M. Gilbert, 3,941,878.
Moyers, Thomas E., Jr., to United States of America, Army. Automatic focus pulse gated system. 3,941,999, Cl. 250-213.0VT.
MTS Systems Corporation: *See*—
Meline, Harry R., 3,940,975.
Mueller, Curt; and Schmid, Hans-Rudolf, to Sandoz Ltd., (Sandoz AG). Bis(triazinylamino) stilbene compounds. 3,941,778, Cl. 260-240.00B.
Mueller, Milton W., to TRW Inc. Control unit and method. 3,941,035, Cl. 92-49.000.
Mueller, Milton W.: *See*—
Nasvytis, Pius J.; and Mueller, Milton W., 3,941,505.
Muller, Anton, to Eisen- und Drahtwerk Erlau Aktiengesellschaft. Connecting link, especially for tire chains. 3,941,175, Cl. 152-242.000.

Mullin, Alexander G.: *See—*
Barr, Anthony J.; and Mullin, Alexander G., 3,942,021.

Multi-State Devices Ltd.: *See—*
Maran, Richard I.; and Meijer, Robert S., 3,942,075.

Munch, Joseph, to Compagnie Generale de Radiologie. Film transport mechanism. 3,941,368, Cl. 271-5.000.

Munder, Paul Gerhard; Modolell, Manuel; and Wallach, Donald Francis Hoelzl, to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V. Apparatus for culturing cells. 3,941,662, Cl. 195-127.000.

Murakami, Kiyoharu, to Kabushiki Kaisha Daikin Seisakusho. Inching valve. 3,941,223, Cl. 192-4.00A.

Murakami, Mutsuaki, to Matsushita Electric Industrial Co., Ltd. Charge transfer complexes containing 7,7,8,8-tetracyanoquinodimethane and an N-substituted quaternary quinoline. 3,941,792, Cl. 260-286.00Q.

Murao, Yoshio. Cleaning machine for bobbins with waste slivers. 3,940,825, Cl. 15-306.00B.

Muraoka, Teruo, to Victor Company of Japan, Limited. Band-pass filter for frequency modulated signal transmission. 3,942,126, Cl. 328-167.000.

Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Toda, Toshimasa; Mori, Eiko; Horiuchi, Hideo; Higashida, Susumu; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohata, Noriyuki; and Ohsawa, Hisayou, to Sankyo Company Limited. Piperidine derivatives and their use as stabilizers. 3,941,744, Cl. 260-45.80N.

Murfree, James A., Jr.: *See—*
Phillips, John F.; Murfree, James A., Jr.; Wharton, Walter W.; and Duncan, William A., 3,941,626.

Murphy, Harry C., Jr.: *See—*
Bryson, Millard C.; Murphy, Harry C., Jr.; Murphy, James R.; and Stauffer, Harry C., 3,941,680.

Murphy, James R.: *See—*
Bryson, Millard C.; Murphy, Harry C., Jr.; Murphy, James R.; and Stauffer, Harry C., 3,941,680.

Murray, Leo Thomas: *See—*
King, William James; Murray, Leo Thomas; and Salzman, Gerhard Martin, 3,941,877.

Murre, Robert W.: *See—*
Huston, James E.; and Murre, Robert W., 3,941,978.

Muscan, Alexandru Ioan, to Institutul de Cercetari si Proiectari Pentru Utilaj Chimic si Rafinarii. Method for the determination of shrinkage effect. 3,940,973, Cl. 73-88.00R.

Musgrave, Daniel D. Process for making barbed material. 3,941,164, Cl. 140-58.000.

Mustee, Bernard, to E. L. Mustee & Sons, Inc. Free-standing shower stalls. 3,940,806, Cl. 4-146.000.

Mutschler, Otto. Fountain pen. 3,941,491, Cl. 401-243.000.

Myers, Allen D., to Caterpillar Tractor Co. Dual piston brake arrangement and cooling circuit therefor. 3,941,219, Cl. 188-170.000.

N. V. Bekaert S.A.: *See—*
Binard, Edouard, 3,941,703.

Nabalco Engineering Pty. Limited: *See—*
Gower, Gordon Shields, 3,940,942.

Nabeyama, Hiroaki: *See—*
Mohri, Katsuo; Watatani, Yoshizumi; Nabeyama, Hiroaki; and Yoshino, Takehiko, 3,941,930.

Nadelson, Jeffrey: *See—*
Houlihan, William J.; and Nadelson, Jeffrey, 3,941,888.

Naegeli, Werner, to Pavena AG. Method of continuously impregnating a textile fiber arrangement with liquids. 3,941,905, Cl. 427-240.000.

Nagahara, Yasumori; and Suzuki, Kohji, to Ricoh Co., Ltd. Photosensitive drum for electrophotographic copying machines. 3,941,472, Cl. 355-16.000.

Nagai, Yuichi: *See—*
Yamamoto, Shizuo; Nagai, Yuichi; Shimizu, Nobuyuki; and Tajimi, Hiroshi, 3,940,895.

Nakada, Masahiko: *See—*
Kobayashi, Nobuyuki; and Nakada, Masahiko, 3,941,106.

Nakagawa, Toru: *See—*
Wakabayashi, Hiroshi; Nakagawa, Toru; Matsumura, Shoichi; and Fujii, Shigeru, 3,941,757.

Nakamura, Motoharu: *See—*
Takashina, Kikuo; Kitayama, Minoru; Nakamura, Motoharu; Suga, Yozo; and Tanaka, Kiyoshi, 3,941,623.

Nakamura Sangyo Co., Ltd.: *See—*
Nakamura, Yoshihira, 3,941,081.

Nakamura, Shoichi; Inui, Toshiaki; and Horiike, Yoshio, to Matsushita Electric Industrial Co., Ltd. Zone time display clock. 3,940,920, Cl. 58-42.500.

Nakamura, Yoshihira, to Nakamura Sangyo Co., Ltd. Alarm for a bicycle. 3,941,081, Cl. 116-142.0FP.

Nakanishi, Mutsuo, to Quasar Electronics Corporation. Multiband tuner control system. 3,942,122, Cl. 325-459.000.

Nakano, Seizo: *See—*
Sasaki, Kouji; Nakano, Seizo; and Tsubaki, Tohru, 3,941,963.

Nakasone, Henry H.: *See—*
Kidder, Richard A.; Nakasone, Henry H.; and Jimerson, Bruce D., 3,941,397.

Nalco Chemical Company: *See—*
Hoffmann, Karl H.; and Anderson, Donald R., 3,941,720.

Nangia, Rajendar Kumar, to British Aircraft Corporation Limited. Aircraft air intakes. 3,941,336, Cl. 244-53.00B.

Nash, Harold G., to Motorola, Inc. Two of eight tone encoder. 3,941,942, Cl. 179-90.00K.

Nast, Roland: *See—*
Maassen, Dieter; Nast, Roland; Bormann, Heinrich; Piechota, Helmut; and Kraft, Karl-Josef, 3,941,769.

Nasvytis, Pius J.; and Mueller, Milton W., to TRW Inc. Method and apparatus for pumping fuel. 3,941,505, Cl. 417-202.000.

National Association of Furniture Manufacturers, Inc.: *See—*
Barr, Anthony J.; and Mullin, Alexander G., 3,942,021.

National Patent Development Corporation: *See—*
Shepherd, Thomas H.; and Gould, Francis E., 3,941,858.

National Research Development Corporation: *See—*
Creighton, Andrew Malcolm, 3,941,790.
Huxley, Hugh Esmor, 3,942,015.
Lawson, Robert Crawford; Porter, David; and Hannan, William James, 3,942,013.

NEC Sylvania Corporation: *See—*
Kaneda, Isao, 3,942,069.

Nees, John M., to General Battery Corporation. Battery package and method. 3,941,617, Cl. 136-170.000.

Neese, Wayne E., to GTE Automatic Electric Laboratories Incorporated. Multi-element reed capsule sealing apparatus and method for making. 3,941,575, Cl. 65-59.00A.

Nehrig, R. Harlan; and White, Nicholas J., to Auto Specialities Manufacturing Company. Bumper screw jack. 3,941,352, Cl. 254-98.000.

Nelson, George D.; Nissing, Kenneth J.; and Symes, William F., to Monsanto Company. Production of chlorocyanuric acid. 3,941,784, Cl. 260-248.00C.

Nelson, John H. Basketball board game apparatus. 3,941,386, Cl. 273-131.00C.

Nelson, Karl M. Golf club holder. 3,941,398, Cl. 280-47.190.

Nelson, William F.: *See—*
Haugsjaa, Paul Osborne; Nelson, William F.; Regan, Robert James; and McNeill, William Henry, 3,942,058.

Nepro, Inc.: *See—*
McNeely, Charles D., 3,941,311.

Neuronyx Corporation: *See—*
Bucalo, Louis, 3,941,136.

New York Wire Mills Corporation: *See—*
Borodin, Daniel J., 3,940,963.

Newman, Irvin; and Kelly, Michael G., to Fine, Ira W., a part interest. Glass panel circuit breaker. 3,941,975, Cl. 219-509.000.

Newman, Jack R., to Swift and Company Limited. Flowable flocculants for water treatment. 3,941,739, Cl. 260-33.20R.

Newstead, Charles, to Girling Limited. Vehicle shoe drum brakes. 3,941,222, Cl. 188-250.00G.

Newton, Gerald S., to Graham Magnetics Incorporated. Thermally resistant magnetic tape. 3,941,911, Cl. 428-525.000.

Neyraud, Rene, to Verdol S.A. Jacquard reversing mechanism for looms. 3,941,161, Cl. 139-1.00E.

Nicklaus, Karl, to Esec Sales S.A. Process of making wire connections in semi-conductor elements. 3,941,298, Cl. 228-180.00A.

Nicolas, Nabil Y.; and Schmelzle, Christian G., to Selkirk Metalbestos. Barometric draft regulator. 3,941,067, Cl. 110-163.000.

Nicoletti, Robert E. Hair frosting device. 3,941,613, Cl. 132-9.000.

Niedermeyer, Karl O. Safety supervisor for sump pumps and other hazards. 3,941,507, Cl. 417-2.000.

Nienburg, Hans-Juergen: *See—*
Kummer, Rudolf; Nienburg, Hans-Juergen; Hohenschutz, Heinz; Strohmeyer, Max; and Teutsch, Theo, 3,941,848.

Nigol, Olaf; and Rosenblatt, Gordon, to Canadian Porcelain Company Limited. Electrical insulator including an insulation shell having hardware members secured thereto by cement containing graphite fibers. 3,941,918, Cl. 174-140.00C.

Nihon Tokushu Noyaku Seizo Kabushiki Kaisha: *See—*
Okauchi, Tetsuo; Takamuku, Shoji; Tamura, Saburo; and Chou, Seifun, 3,941,879.

Niikawa, Masahiro: *See—*
Kano, Motomi; Shioyama, Hitoshi; Takeuti, Yasuhito; and Niikawa, Masahiro, 3,941,974.

Nikami, Akira, to Sony Corporation. Pulse waveform generator circuit. 3,942,042, Cl. 307-268.000.

Nilodor Company, Inc., The: *See—*
Garbe, Siegfried, 3,941,283.

Nilsen, Norman P., Jr. Waterer valve actuator-float. 3,941,094, Cl. 119-80.000.

Nippon Electric Company Limited: *See—*
Kageyama, Takao; and Morizumi, Yoshiro, 3,942,066.
Kawase, Katsuyuki; Sato, Mutumi; Hamada, Kuniaki; and Hayashi, Seiji, 3,941,985.
Shiki, Haruo, 3,942,118.

Nippon Hoso Kyokai: *See—*
Mohri, Katsuo; Fukuda, Masaaki; Kayano, Tatsuo; and Yoshino, Takehiko, 3,941,920.
Tanaka, Yasuo; Yamamoto, Hideaki; Ooki, Keiko; Goto, Naohiro; and Takigawa, Toru, 3,941,672.

Nippon Kogaku Kabushiki Kaisha: *See—*
Kawakami, Tadashi, 3,941,457.

Nippon Noso Kyokai: *See—*
Mohri, Katsuo; Watatani, Yoshizumi; Nabeyama, Hiroaki; and Yoshino, Takehiko, 3,941,930.

Nippon Piston Ring Co., Ltd.: *See—*
Shin, Keiichiro; Ozeki, Hiroshi; and Kurio, Noriyuki, 3,941,523.

Nippon Selfoc Kabushiki Kaisha: *See—*
Kitano, Ichiro; Koizumi, Ken; and Matsumura, Hiroyoshi, 3,941,474.

Nippon Shokubai Kagaku Kogyo Co., Ltd.: *See*—
Koike, Hiroshi; Fukui, Akio; Ito, Yuji; Tanaka, Takehiko; and Okuda, Yukio, 3,941,815.
Nippon Steel Corporation: *See*—
Asano, Hidejiro; and Hiromae, Yoshitaka, 3,941,910.
Takashina, Kikuo; Kitayama, Minoru; Nakamura, Motoharu; Suga, Yozo; and Tanaka, Kiyoshi, 3,941,623.
Nippon Telegraph and Telephone Public Corporation: *See*—
Kato, Katsuhiro; Suzuki, Hideo; Yano, Norio; Kishimoto, Yojiro; and Ishiguro, Ginya, 3,942,142.
Nippon Zeon Co., Ltd.: *See*—
Goto, Kuniaki; and Sakashita, Tatsuo, 3,941,706.
Nippondenso Co., Ltd.: *See*—
Itoh, Katsumi; and Mori, Kazumasa, 3,942,096.
Itoh, Katsumi; and Mori, Kazumasa, 3,942,097.
Nippondenson Co., Ltd.: *See*—
Kurii, Masaaki; Kobari, Kiyoshi; and Yanagi, Osamu, 3,941,204.
Nise, Wilfred C.: *See*—
Phillips, Paul E.; Nise, Wilfred C.; Hommes, Jack L.; and Lowder, Dale E., 3,940,826.
Nishikawa, Shigeru: *See*—
Akami, Hitoshi; Nishikawa, Shigeru; and Kawakami, Tatsuya, 3,942,154.
Nishimune, Koichi: *See*—
Uehara, Kenichiro; Ito, Atsuo; Nishimune, Koichi; and Fujita, Kazutoshi, 3,942,017.
Nishimura, Kaoru, to Shimadzu Seisakusho Ltd. Sailing simulator. 3,940,862, Cl. 35-11.000.
Nishioka, Matsuo, to Matsushita Electric Industrial Company, Limited. Device for simultaneously controlling a plurality of variable resistors. 3,942,148, Cl. 338-128.000.
Nissan Motor Co., Ltd.: *See*—
Hiruma, Mituo, 3,941,403.
Iijima, Tetsuya, 3,941,143.
Takao, Hiroshi; Togawa, Kinmochi; Matoba, Kazuo; and Hata, Yoshitaka, 3,941,673.
Takeuchi, Yasuhisa, 3,942,151.
Nisser, Henrik Gustaf Folke; Petersen, Jorgen; and Porrvik, Sten Erik, to Kemanord Aktiebolag. Method for the preparation of paper containing plastic particles. 3,941,634, Cl. 156-79.000.
Nissing, Kenneth J.: *See*—
Nelson, George D.; Nissing, Kenneth J.; and Symes, William F., 3,941,784.
Nittel, Fritz: *See*—
Pelz, Willibald; Credner, Hans-Heinrich; Schulte, Walter; Klein, Alfons; Wedemeyer, Karlfried; and Nittel, Fritz, 3,941,601.
Nittetu Chemical Engineering Ltd.: *See*—
Tsuruta, Hidemasa; Hiwatashi, Yukinori; Hirabayashi, Teruhiko; and Kumata, Seiji, 3,941,875.
Nivet, Andre, to ITW de France. Extremities of decorative mouldings. 3,940,901, Cl. 52-717.000.
Niznik, Emil John, to Bunker Ramo Corporation. Friction detent to permit setting of digital clock. 3,940,921, Cl. 58-85.500.
Noll, Lewis H.: *See*—
Ambrose, Robert; and Noll, Lewis H., 3,940,932.
Nonaka, Kohei; Fukushima, Masayoshi; and Sakai, Kunio, to Asahi Kasei Kogyo Kabushiki Kaisha. Shock sensor. 3,940,999, Cl. 73-516.0LM.
Noranda Mines Limited: *See*—
Bharucha, Nanabhai R.; and Claessens, Pierre L., 3,941,669.
Norell, John R.; and Gardner, Lloyd E., to Phillips Petroleum Company. Chromatographic separation of olefins. 3,940,972, Cl. 73-23.100.
Normac, Inc.: *See*—
Klein, Max, 3,941,729.
Norman, Telfer E.; and Stolk, Douglas A., to Amax Inc. Abrasion-resistant refrigeration-hardenable white cast iron. 3,941,589, Cl. 75-125.000.
North American Philips Corporation: *See*—
Dougherty, Joseph Patrick; Kurtz, Stewart K.; and Seymour, Robert John, 3,941,478.
Northcutt, Michael E. Fish lure. 3,940,868, Cl. 43-17.600.
Northrop Corporation: *See*—
Leiboff, Teague N., 3,941,924.
Northwestern Steel and Wire Company: *See*—
Shinville, Gerald T.; and Proeger, Linden P., 3,941,359.
Noteboom, William D., to University of Missouri, The Curators of the. Roller culture bottle insert. 3,941,661, Cl. 195-127.000.
Nozaki, Toll: *See*—
Sadamatsu, Shigeru; and Nozaki, Toll, 3,941,898.
Nozaki, Yasuo: *See*—
Itoh, Hayami; Yamada, Mamoru; and Nozaki, Yasuo, 3,941,066.
Nunes, Abner H. Burial means and the like. 3,940,894, Cl. 52-129.000.
Nunnally, Marion Diehl, Jr. Loading apparatus for round bales. 3,941,265, Cl. 214-505.000.
Nuovo Pignone S.p.A.: *See*—
Santucci, Nicola, 3,941,986.
Nystrom, Per Henrik Gosta, to Forenade Fabriksverken. Method for regulating the output of a stirling-type hot gas engine and device for the same. 3,940,933, Cl. 60-522.000.
Oakerbee, Raymond Mitchell: *See*—
Ballinger, Maurice Gordon; and Oakerbee, Raymond Mitchell, 3,941,318.
Oaktree Equipment Limited: *See*—
Ballinger, Maurice Gordon; and Oakerbee, Raymond Mitchell, 3,941,318.
Oberretl, Kurt, to BBC Brown Boveri & Company Limited. Linear motor winding. 3,942,050, Cl. 310-13.000.
O'Brien, John Augustus, to Itek Corporation. Bi-stable image storage apparatus. 3,941,455, Cl. 350-160.0LC.
Occidental Petroleum Corporation: *See*—
Burton, Robert S., III; Cha, Chang Yul; and Ridley, Richard D., 3,941,421.
O'Connor, Bartholomew John, to Talcoma Teoranta. Inspection of containers. 3,942,001, Cl. 250-223.00B.
O'Doherty, George O. P., to Eli Lilly and Company. Rodenticidal imidazo-pyridines. 3,941,882, Cl. 424-263.000.
Odru, Rene; and Vacher, Jacques, to Commissariat a l'Energie Atomique. Method and a device for localizing a light impact on the photocathode of a photomultiplier. 3,941,997, Cl. 250-207.000.
Oe, Noboru; and Tsuboi, Yozi, to Okura Yusoki Kabushiki Kaisha. Apparatus for loading goods on a pallet. 3,941,048, Cl. 100-215.000.
Offermanns, Heribert: *See*—
von Bebenburg, Walter; and Offermanns, Heribert, 3,941,775.
Officine Savio, S.p.A.: *See*—
D'Agnolo, Armando; and Favero, Giovanni, 3,941,323.
Oganesian, Oganes Vardanovich: *See*—
Volkov, Mstislav Vasilievich; and Oganesian, Oganes Vardanovich, 3,941,123.
Ogg, Dustin Lance, to Carlton Company. Positioning clamp. 3,941,363, Cl. 269-100.000.
Oglander, Allen H.; and Shannon, Richard E. Label dispensing machine. 3,941,278, Cl. 221-73.000.
Ogle, Robert W., to IMS Limited. Device for administration of viscous fluids for the urethal tract. 3,941,131, Cl. 128-237.000.
Ogle, Robert W., to IMS Limited. Fluid transfer device. 3,941,171, Cl. 141-309.000.
Ohashi, Takashi: *See*—
Yukuta, Toshio; Ohashi, Takashi; and Yoshsii, Hiroshi, 3,941,732.
Ohata, Noriyuki: *See*—
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Toda, Toshimasa; Mori, Eiko; Horiuchi, Hideo; Higashida, Susumu; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohata, Noriyuki; and Ohsawa, Hisayou, 3,941,744.
Ohkawa, Hideo: *See*—
Tomikawa, Masami; Ishitobi, Hiroyuki; and Ohkawa, Hideo, 3,940,811.
Ohki, Seibi, to Diesel Kiki Kabushiki Kaisha. Hydraulic, automatically adjustable timing device for fuel injection. 3,940,949, Cl. 64-25.000.
Ohki, Seisaku: *See*—
Ohno, Genji; Uchiyama, Tadamitsu; Ohki, Seisaku; and Morohashi, Hishao, 3,941,312.
Ohlhaber, Ronald L.: *See*—
Olinger, Charles P.; Ohlhaber, Ronald L.; and Kot, Casey, 3,941,121.
Ohmiya, Shoji; and Yoshimatsu, Toshio, to Matsushita Electric Industrial Co., Ltd. Record disk loading system. 3,941,391, Cl. 274-9.00B.
Ohno, Genji; Uchiyama, Tadamitsu; Ohki, Seisaku; and Morohashi, Hishao, to Research and Development Laboratories of Ohno Company Limited. Ink jet nozzle for use in a recording unit. 3,941,312, Cl. 239-15.000.
Ohsawa, Hisayou: *See*—
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Toda, Toshimasa; Mori, Eiko; Horiuchi, Hideo; Higashida, Susumu; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohata, Noriyuki; and Ohsawa, Hisayou, 3,941,744.
Oishi, Masanori; Koyanagi, Harusige; and Matsumoto, Kazuo, to Furukawa Electric Co., Ltd., The. Damper for an overhead transmission line. 3,941,914, Cl. 174-42.000.
Okada, Ryozo; Iuchi, Munenori; and Yamada, Munemitsu, to Dunlop Limited. Pneumatic tires. 3,941,177, Cl. 152-362.00R.
Okamoto, Keiichi; Matsumoto, Yoshio; and Oshima, Yasujiro, to Hitachi, Ltd.; and Oshima, Yasujiro. Scanning photoelectric microscope. 3,941,980, Cl. 235-92.0GC.
Okamoto, Toyoo, to Ricoh Co., Ltd. Dry type developing device for a copying apparatus or like apparatus. 3,941,469, Cl. 355-3.0DD.
Okauchi, Tetsuo; Takamuku, Shoji; Tamura, Saburo; and Chou, Seifun, to Takeda Chemical Industries, Ltd.; and Nihon Tokushu Noyaku Seizo Kabushiki Kaisha. Method for increasing yield of silkworm cocoons employing juvenile and moulting hormones. 3,941,879, Cl. 424-240.000.
Okuda, Yukio: *See*—
Koike, Hiroshi; Fukui, Akio; Ito, Yuji; Tanaka, Takehiko; and Okuda, Yukio, 3,941,815.
Okuhara, Shinzi, to Hitachi, Ltd. Semiconductor speech path switch circuitry. 3,942,040, Cl. 307-252.00G.
Okura Yusoki Kabushiki Kaisha: *See*—
Oe, Noboru; and Tsuboi, Yozi, 3,941,048.
Olaf Fjeldsend A/S: *See*—
Sundt, Eilert, 3,941,700.
Oldenburg, Dorrance, to Caterpillar Tractor Co. Debarking assembly for tree harvesters. 3,941,174, Cl. 144-208.00J.
Olin Corporation: *See*—
Babiec, John S., Jr.; and Schnabel, Wilhelm J., 3,941,822.
Caule, Elmer J., 3,941,627.
Caule, Elmer J., 3,941,628.
Macken, Elmer Nelson, 3,941,676.
Pryor, Michael J.; Crane, Jacob; Friedman, Sam; and Shapiro, Eugene, 3,941,620.
Shapiro, Eugene; and Crane, Jacob, 3,941,619.

Olinger, Charles P.; Ohlhaber, Ronald L.; and Kot, Casey, to University of Cincinnati, The. Focusing fiber-optic needle endoscope. 3,941,121, Cl. 128-6.000.

Oliver Machinery Company: *See—*
Baldwin, Ralph B.; and Visser, James T., 3,941,019.

Oliver, Wallace: *See—*
Dunwoodie, Duane E.; and Oliver, Wallace, 3,941,950.

Oliverius, Maynard F. Sterile container for enclosing a contaminated article therein. 3,941,245, Cl. 206-438.000.

Olofsson, Hans Kristoffer, to Atlas Copco Aktiebolag. Method and device for injection of liquid. 3,941,520, Cl. 418-9.000.

Olsen, Carl Ivar, to Danfoss A/S. Hydraulic steering apparatus. 3,941,033, Cl. 91-446.000.

Olsen, Willi; Lieske, Manfred; Ehmann, Wolfgang; Krause, Dieter; and Perst, Gerhard, to Siemens Aktiengesellschaft. Arrangement for detecting dielectric breakdowns in metal-clad high-voltage switching and transmission installations. 3,942,030, Cl. 307-117.000.

Omelian, Anatoli: *See—*
Kurtz, Bruce E.; and Omelian, Anatoli, 3,941,568.

Onishi, Akira: *See—*
Yukuta, Toshio; Kojima, Minoru; Onishi, Akira; and Kanbara, Shu, 3,941,847.

Onishi, Kazuo: *See—*
Takahashi, Tadashi; and Onishi, Kazuo, 3,942,083.

Ooki, Keiko: *See—*
Tanaka, Yasuo; Yamamoto, Hideaki; Ooki, Keiko; Goto, Naohiro; and Takigawa, Toru, 3,941,672.

Oostendorp, Joannes Gerard: *See—*
Lameris, Sophia Adriana; van Os, Jan Lambert; and Oostendorp, Joannes Gerard, 3,941,658.

Optical Research and Development Corporation: *See—*
Humphrey, William Edwin, 3,941,451.

Oram, John Anderson, to Ferraris Development and Engineering Company Limited. Means for controlling the displacement of a universally pivoted member. 3,940,984, Cl. 73-189.000.

Orlando, Franklin P.; and Hendriks, Johan, to FMC Corporation. Cotton module builder. 3,941,047, Cl. 100-100.000.

Orlowski, Gerald J., to Central Soya Company, Inc. Apparatus for forming edible rings. 3,941,538, Cl. 425-241.000.

Orthman, Henry K., to Orthman Manufacturing, Inc. Folding tool bar having a transport brace. 3,941,194, Cl. 172-311.000.

Orthman Manufacturing, Inc.: *See—*
Orthman, Henry K., 3,941,194.

Ortiz, Gary R.: *See—*
McKinney, Lynn B.; and Ortiz, Gary R., 3,941,277.

Osakabe, Yoshio, to Sony Corporation. Audio signal mixing system. 3,941,931, Cl. 179-1.00G.

Oscar Mayer & Co., Inc.: *See—*
Balch, James L.; Anderson, James E.; and Sadeski, Boleslaus J., 3,941,234.

Oshima, Yasujiro: *See—*
Okamoto, Keiichi; Matsumoto, Yoshio; and Oshima, Yasujiro, 3,941,980.

Osipov, Anatoly Alexandrovich; Pekov, Nikolai Semenovich; and Semenov, Petr Pavlovich. Apparatus for soldering a plurality of flat conductors on a board. 3,941,292, Cl. 228-35.000.

Osorio, Enrique Peyrani: *See—*
Martin, John; and Osorio, Enrique Peyrani, 3,941,370.

Otaegui-Ugarte, Jose Maria. Protector for vehicle occupant. 3,941,404, Cl. 280-150.0AB.

OTISCA Industries Ltd.: *See—*
Smith, Clay D.; and Keller, D. V., Jr., 3,941,679.

Ott, Walter. Foldable support. 3,941,250, Cl. 211-1.300.

Oumi, Hideo: *See—*
Masuda, Takashi; Sozaki, Shigeyuki; Ando, Masakatsu; and Oumi, Hideo, 3,941,637.

Overstreet, Charles L.: *See—*
Anderson, A. D.; Lauridsen, Walter E.; and Overstreet, Charles L., 3,940,830.

Owens, Edward W.; and Smalley, Ned J., to Owens-Illinois, Inc. Safety closure and container. 3,941,268, Cl. 215-216.000.

Owens-Illinois, Inc.: *See—*
Byrum, Bernard W., Jr.; and Ernsthausen, Roger E., 3,942,161.
Juvinall, John W., 3,941,686.
Owens, Edward W.; and Smalley, Ned J., 3,941,268.
Pei, Yu K.; and Tyson, Jack J., 3,941,117.
Taylor, Lynn J.; and Tobias, John W., 3,941,759.
Uhlig, Albert R., 3,941,542.
Yoldas, Bulent E., 3,941,719.

Oxford, Alexander William: *See—*
Clarke, Robert William; Hartley, David; and Oxford, Alexander William, 3,941,785.

Ozeki, Hiroshi: *See—*
Shin, Keiichiro; Ozeki, Hiroshi; and Kurio, Noriyuki, 3,941,523.

Pacific Roller Die Company, Incorporated: *See—*
Davis, Paul Knight, 3,940,962.

Package Machinery Company: *See—*
Rosander, Russell B., 3,940,930.

Pacsa, Sandor: *See—*
Hankovszky, Olga; Hideg, Kalman; and Pacsa, Sandor, 3,941,788.

Paige, Marshall A., to United States of America, Navy. Anti two-blocking device. 3,941,354, Cl. 254-135.00R.

Palazzetti, Mario, to Fiat Societa per Azioni. Speed or angular position electromagnetic transducer. 3,942,045, Cl. 310-155.000.

Pallagi, Frank. Gas control system for a sanitary landfill. 3,941,556, Cl. 431-202.000.

Pallmann KG. Maschinenfabrik: *See—*
Pallmann, Wilhelm, 3,941,319.

Pallmann, Wilhelm, to Pallmann KG. Maschinenfabrik. Cutter ring having detachable cutter packets. 3,941,319, Cl. 241-290.000.

Pamark, Inc.: *See—*
Troth, John S., 3,941,300.

Panico, Daniel. Whirling toy. 3,940,878, Cl. 46-47.000.

Pantier, Earl A.: *See—*
Jackovitz, John F.; and Pantier, Earl A., 3,941,614.

Parco Scientific Inc.: *See—*
Parker, Bernard I.; and Caldwell, Charles W., 3,941,452.

Park, Yoon Soo; and Shin, Bok Kyoon, to United States of America, Air Force. Method of fabricating ion implanted znse p-n junction devices. 3,940,847, Cl. 29-590.000.

Parker, Bernard I.; and Caldwell, Charles W., to Parco Scientific Inc. Microscopes. 3,941,452, Cl. 350-82.000.

Parker, Earl Brewer, Jr.: *See—*
Roth, Clarence Edward, Jr.; Lasswell, Joseph Arnold; Bybee, William Dennis; and Parker, Earl Brewer, Jr., 3,941,747.

Parker-Hannifin Corporation: *See—*
Malott, Thomas J., 3,941,513.

Parker, William D., to Joyce Western Corporation. Apparatus for applying foam coating to preformed pipe. 3,941,531, Cl. 425-96.000.

Parker, William Lawrence, to E. R. Squibb & Sons, Inc. O-acyl derivatives of antibiotic EM-49. 3,941,762, Cl. 260-112.50R.

Parkes, Ralph C. Curved path delivery conveyor. 3,941,232, Cl. 198-20.00R.

Pars, Harry George: *See—*
Harris, Louis Selig; Pars, Harry George; Razdan, Raj Kumar; and Sheehan, John Clark, 3,941,782.

Particle Measuring Systems, Inc.: *See—*
Knollenberg, Robert George; and Dascher, Albury John, 3,941,982.

Passarella, Michael T.: *See—*
Farnam, Robert G.; and Passarella, Michael T., 3,941,640.

Passavant-Werke Michelbacher Huette: *See—*
Stahl, Ulrich; Busse, Oswald; Klesper, Hugo; and Junker, Werner, 3,941,701.

Patel, Anilkumar U., to Continental Can Company, Inc. Pull tab anti-rotation mounting. 3,941,276, Cl. 220-270.000.

Patentex S.A.: *See—*
Lacoste, Francois Rene, 3,941,380.

Paterson, Albert E. Motor support. 3,941,344, Cl. 248-351.000.

Pattis, Erich: *See—*
Schatka, Gunther; Kruger, Wilm; Paulus, Rudolf; Koleff, Boris; Pattis, Erich; and Hartwig, Karl, 3,941,471.

Paule, Helmut Paul; and Kinzler, Oskar Leonard. Pin rope control. 3,941,379, Cl. 273-44.000.

Pauliukonis, Richard S. Intensifier. 3,940,937, Cl. 60-533.000.

Paulsen, Lewis A.: *See—*
Hauser, Karl V.; and Paulsen, Lewis A., 3,941,585.

Paulson, Arnold E.: *See—*
Jabsen, Felix S.; Schluderberg, Donald C.; and Paulson, Arnold E., 3,941,187.

Paulus, Rudolf: *See—*
Schatka, Gunther; Kruger, Wilm; Paulus, Rudolf; Koleff, Boris; Pattis, Erich; and Hartwig, Karl, 3,941,471.

Pavena AG: *See—*
Naegeli, Werner, 3,941,905.

Payne, Larry D.: *See—*
Ver Nooy, Burton; Payne, Larry D.; and Kendall, Robert L., 3,940,855.

Payne, Robert A.: *See—*
Slobodzian, Gregory E.; Zielinski, Stanley A.; and Payne, Robert A., 3,941,926.

Payne, Thomas F., to Anaconda Aluminum Co. Recovery of aluminum fluoride. 3,941,874, Cl. 423-489.000.

Paynter, John D., to Exxon Research and Engineering Company. Process for reactivation of iridium-containing catalysts. 3,941,716, Cl. 252-415.000.

PCI Group, Inc.: *See—*
Colby, Harold S.; and Landry, Raymond H., 3,940,844.

Pearl, Richard E.: *See—*
Collins, Albert V.; and Pearl, Richard E., 3,941,606.

Peevey, Robert M., to Standard Oil Company. Subsurface wellhead shield. 3,941,189, Cl. 166-.500.

Pei, Yu K.; and Tyson, Jack J., to Owens-Illinois, Inc. Cooktop for a gas-fired range. 3,941,117, Cl. 126-215.000.

Pekov, Nikolai Semenovich: *See—*
Osipov, Anatoly Alexandrovich; Pekov, Nikolai Semenovich; and Semenov, Petr Pavlovich, 3,941,292.

Pelz, Willibald; Credner, Hans-Heinrich; Schulte, Walter; Klein, Alfons; Wedemeyer, Karlfried; and Nittel, Fritz, to AGFA-Gevaert, A.G. Photographic silver halide material which contains color couplers. 3,941,601, Cl. 96-100.000.

Peral, Juan Jose Zubeldia; and Llona, Jose Luis Gomex, to Arteche, Instrumentacion y Sistemas Electronicos, S.A. Fault detection and signaling system. 3,942,166, Cl. 340-213.100.

Perkinson, John W. One-handed serving tray. 3,941,286, Cl. 224-48.00C.

Perrinelle, Alexandre G.; and Benjamin, Edward C. Device for slitting wieners for barbecuing. 3,940,842, Cl. 30-278.000.

Perrotti, Emmanual J.; and Leger, Donald Roy, to International Telephone and Telegraph Corporation. Method of measuring antenna reflector surface accuracy. 3,940,858, Cl. 33-228.000.

Perry, Thomas William, 3rd. Method and apparatus for making a thermal compress. 3,940,905, Cl. 53-14.000.

Perst, Gerhard: *See—*
Olsen, Willi; Lieske, Manfred; Ehmann, Wolfgang; Krause, Dieter; and Perst, Gerhard, 3,942,030.

Petaja, Gary Merlin: *See—*
Engstrom, John Gordon; and Petaja, Gary Merlin, 3,941,951.

Peters and Company, Inc.: *See—*
Menzin, Marvin; and Robinson, Hugh A., 3,941,440.

Peters, Jack; and Barrett, DeLoris Joan. Barrel carrier. 3,941,399, Cl. 280-47.290.

Petersen, Jorgen: *See—*
Nisser, Henrik Gustaf Folke; Petersen, Jorgen; and Porrvik, Sten Erik, 3,941,634.

Peterson, Albert H.; and Peterson, Howard L., to Hercules Incorporated. Armor piercing projectile. 3,941,057, Cl. 102-52.000.

Peterson, Eugene W.; Wurtz, Howard P., Jr.; and Winner, Marvin R., to United States of America, Navy. Joule-Thomson cryostat cooled infrared cell having a built-in thermostat sensing element. 3,942,010, Cl. 250-352.000.

Peterson, Howard L.: *See—*
Peterson, Albert H.; and Peterson, Howard L., 3,941,057.

Peterson, Lawrence Gordon, to Air Products and Chemicals, Inc. Solids separation. 3,941,687, Cl. 209-136.000.

Peterson, Marvin A.: *See—*
Kasik, Robert L.; and Peterson, Marvin A., 3,941,891.

Petersson, Ralf Krister Ebbe, to Kalmar Verkstads AB. Mechanism for connecting and disconnecting the service lines of a tractor-semitrailer combination. 3,941,408, Cl. 280-421.000.

Petrini, Bartholomew. Patient transfer apparatus. 3,940,808, Cl. 5-86.000.

Petry, Chester H., Jr.; and Hensley, J. Carl, to Byers Photo Equipment Company. Apparatus for forming a tabbed film strip. 3,941,646, Cl. 156-545.000.

Pettersen, Kjell. Bait holder. 3,940,870, Cl. 43-44.200.

Pettersson, Georg Gustaf Lennart, to Telefonaktiebolaget L M Ericsson. Verification arrangement. 3,942,152, Cl. 340-146.10D.

Petty, Preston L.; Harreld, Albert F.; and Scott, Gary M., to Petty, Preston L. Tail light and fender. 3,941,994, Cl. 240-8.10R.

Pfefferle, William C., to Engelhard Minerals & Chemicals Corporation. Method of operating catalytically supported thermal combustion system. 3,940,923, Cl. 60-39.060.

Pfizer Inc.: *See—*
Lipinski, Christopher Andrew, 3,941,889.

Pfouts, John Richard, to Whirlpool Corporation. Method and apparatus for testing electric motors. 3,942,111, Cl. 324-158.0MG.

Philadelphia Quartz Company: *See—*
Weldes, Helmut H., 3,941,723.

Philip Morris Incorporated: *See—*
Braginetz, Paul A., 3,941,244.

Phillips, John F.; Murfree, James A., Jr.; Wharton, Walter W.; and Duncan, William A., to United States of America, Army. Energetic liquid monopropellant compositions containing hydrazine and methoxylamine perchlorate. 3,941,626, Cl. 149-36.000.

Phillips, John P. Ignition booster. 3,941,108, Cl. 123-148.00E.

Phillips, Paul E.; Nise, Wilfred C.; Hommes, Jack L.; and Lowder, Dale E., to Clarke-Gravely Corporation. Portable surface cleaner. 3,940,826, Cl. 15-320.000.

Phillips Petroleum Company: *See—*
Norell, John R.; and Gardner, Lloyd E., 3,940,972.
Platt, Louis, 3,941,530.
Scoggin, Jack S., 3,941,664.

Philofsky, Harold M.; and Wu, Julius J., to Westinghouse Electric Corporation. Flexible belt arrangement for securing winding conductors. 3,942,057, Cl. 310-260.000.

Piber, Earl T., to Cutler-Hammer, Inc. Snap-in bushing and frame devices for mounting in a hole in a panel. 3,941,965, Cl. 200-296.000.

Pickett, Oscar A., Jr.: *See—*
Chapman, Richard D.; Holmer, Donald A.; Pickett, Oscar A., Jr.; and Saunders, James H., 3,941,755.

Piechota, Helmut: *See—*
Maassen, Dieter; Nast, Roland; Bormann, Heinrich; Piechota, Helmut; and Kraft, Karl-Josef, 3,941,769.

Pierce, Edgar M. Apparatus for comminuting and extracting. 3,941,316, Cl. 241-15.000.

Pierre Fabre S.A.: *See—*
Stenger, M. Antoine; Cousse, Henri; and Mouzin, M. Gilbert, 3,941,878.

Pierret, Gabriel: *See—*
Pierret, Hubert; Pierret, Luc; Pierret, Gabriel; Pierret, Maurice; and Pierret, Jean-Marie, 3,941,235.

Pierret, Hubert; Pierret, Luc; Pierret, Gabriel; Pierret, Maurice; and Pierret, Jean-Marie. Conveyor with means for preventing accumulation of material. 3,941,235, Cl. 198-27.000.

Pierret, Jean-Marie: *See—*
Pierret, Hubert; Pierret, Luc; Pierret, Gabriel; Pierret, Maurice; and Pierret, Jean-Marie, 3,941,235.

Pierret, Luc: *See—*
Pierret, Hubert; Pierret, Luc; Pierret, Gabriel; Pierret, Maurice; and Pierret, Jean-Marie, 3,941,235.

Pierret, Maurice: *See—*
Pierret, Hubert; Pierret, Luc; Pierret, Gabriel; Pierret, Maurice; and Pierret, Jean-Marie, 3,941,235.

Pierson, Michael L. Electromechanically actuated gate valve apparatus. 3,941,349, Cl. 251-100.000.

Pieuchard, Guy: *See—*
Laude, Jean Pierre; and Pieuchard, Guy, 3,942,048.

Piguet, Paul, to Portescap. Shock absorber bearing assembly. 3,941,439, Cl. 308-159.000.

Pike, Leslie Clark: *See—*
Creasey, Norman Geoffrey; and Pike, Leslie Clark, 3,941,856.

Pinede, Edouard: *See—*
Graham, Keith; Korsky, Viacheslav; Elmer, Christopher; Pinede, Edouard; Litster, John; and Aarts, Jan, 3,941,936.

Pinter, Zoltan: *See—*
Grega, Erzsebet; Gribovszky, Pal; Marosvolgyi, Sandor; Pinter, Zoltan; Szilagyi, Gyula; Szita, Istvan; Tarr, Csaba; and Tasi, Laszlo, 3,941,783.

Pirson, Ewald: *See—*
Bosch, Erhard; Pirson, Ewald; and Roth, Michael, 3,941,864.

Pissiotas, Georg; and Durr, Dieter, to Ciba-Geigy Corporation. N-phenyl-N'-carbophenoxy formamidines. 3,941,829, Cl. 260-471.00C.

Piton, William J.: *See—*
Powers, Michael D.; and Piton, William J., 3,941,690.

Placek, Eugene W., to International Magna Corporation. Infrared heat generator. 3,941,116, Cl. 126-92.00B.

Plasil, Vladimir: *See—*
Hyanova, Blanka; and Plasil, Vladimir, 3,942,049.

Plass, Klaus Gottfried: *See—*
Schilz, Wolfram; Rahlff, Manfred; Schmidt, Uwe Jurgen; Plass, Klaus Gottfried; and Schroder, Eckhard, 3,941,456.

Plastofilm Industries, Inc.: *See—*
Simmons, Richard J., 3,941,275.

Platt, Frederick J. Convertible camper trailer. 3,941,414, Cl. 296-23.00G.

Platt, Louis, to Phillips Petroleum Company. Conversion of nonwoven fabric into staple fibers. 3,941,530, Cl. 425-83.000.

Platt Saco Lowell Limited: *See—*
Hewitt, Arthur Raymond, 3,941,322.

Pleznac, Ida M. Quantity indicating injection device. 3,941,129, Cl. 128-218.00R.

Ploger, Walter; Schmidt-Dunker, Manfred; and Gloxhuber, Christian, to Henkel & Cie G.m.b.H. Azacycloalkane-2,2-diphosphonic acids. 3,941,772, Cl. 260-239.00B.

PMD Entwicklungswerk fur Kunststoff-Maschinen GmbH & Co. KG: *See—*
Thiele, Hans Dietrich, 3,941,541.

Pochard, Raymond: *See—*
Delisle, Jean-Paul; Pochard, Raymond; Porte, Robert; and Prouteau, Lucien, 3,941,652.

Podola, Nikolai Vasilievich: *See—*
Bondarenko, Oleg Petrovich; Medovar, Boris Izrailevich; Podola, Nikolai Vasilievich; Kravchuk, Anatoly Iosifovich; Marchenko, Alexandr Mikhailovich; Baglai, Vitaly Mikhailovich; Vernik, Alexandr Borisovich; Kamensky, Leonid Alexeevich; Us, Vasily Ivanovich; Mokhnach, Vladislav Konstantinovich; and Andrianov, Georgy Grigorievich, 3,942,105.

Polaroid Corporation: *See—*
Blinow, Igor; Johnson, Bruce K.; and Whiteside, George D., 3,942,184.
Borror, Alan L., 3,941,807.
Ellin, Seymour, 3,942,076.
Manning, Monis J., 3,941,597.
Walworth, Vivian K., 3,941,600.
Whiteside, George D., 3,942,183.

Pollinger, Hans: *See—*
Kubath, Gerhard; and Pollinger, Hans, 3,941,430.

Pollmann, Fritz; and Holzer, Wilhelm, to Siemens Aktiengesellschaft. Electromagnetic switching apparatus, particularly motor contactor, with auxiliary contacts. 3,942,143, Cl. 335-132.000.

Pollock, Donald M.; and Hallowell, Fulton W., to Consupak, Inc. Method for multiple blow molding with rotary turntable. 3,941,863, Cl. 264-98.000.

Poot, Albert Lucien: *See—*
Van Goethem, Hugo Vital; Hazenbosch, Edwin Hendrik; and Poot, Albert Lucien, 3,941,598.

Porrvik, Sten Erik: *See—*
Nisser, Henrik Gustaf Folke; Petersen, Jorgen; and Porrvik, Sten Erik, 3,941,634.

Porte, Robert: *See—*
Delisle, Jean-Paul; Pochard, Raymond; Porte, Robert; and Prouteau, Lucien, 3,941,652.

Porter, David: *See—*
Lawson, Robert Crawford; Porter, David; and Hannan, William James, 3,942,013.

Portescap: *See—*
Piguet, Paul, 3,941,439.

Portmann, Werner: *See—*
Bosshard, Peter; Portmann, Werner; and Wust, Olivier, 3,941,321.

Postlethwaite, William F., to Skycell Corporation. Modular accommodation system. 3,940,890, Cl. 52-79.000.

Potter, Thomas R., to Indicator Controls Corporation. Digital test instrument. 3,942,108, Cl. 324-59.000.

Powers, Howard A., to Modicon Corporation. Modular panel construction for programmable controller and frame therefore. 3,942,077, Cl. 317-118.000.

Powers, Michael D.; and Piton, William J., to Piton, William J. Portable sluice pan. 3,941,690, Cl. 209-443.000.

Pozniak, Donald J.; and Siewert, Robert M., to General Motors Corporation. Air diverter valve. 3,940,928, Cl. 60-289.000.

PPG Industries, Inc.: *See—*
Schwenninger, Ronald L., 3,941,577.
Welton, Wright M., Jr., 3,941,576.

Prameta Prazisionsmetall -und Kunststofferzeugnisse G. Baumann & Co.: *See—*
Grunert, Hellmuth; and Vitt, Theodor, 3,940,829.

Pratt, George W., Jr., to Massachusetts Institute of Technology. Method of altering biological and chemical activity of molecular species. 3,941,670, Cl. 204-158.00R.

Pratt, Howard G.: *See—*
Sivachenko, Eugene W.; and Pratt, Howard G., 3,940,965.

Pratt, Richard J., to Atlantic Richfield Company. Product. 3,941,808, Cl. 260-326.260.

Prech, Vaclav: *See—*
Apenberg, Walter; Bohme, Georg; Fanger, Hans-Ulrich; Glaser, Benno; Hain, Klaus; Hubener, Jorg; Stegmaier, Winfried; Prech, Vaclav; and Vagner, Jaroslav, 3,942,003.

Precisa AG. Rechenmaschinenfabrik, Firma: *See—*
Keiser, Fritz, 3,941,228.

Precision Fukuhara Works, Ltd.: *See—*
Sawazaki, Masatoshi, 3,940,950.

Precision Tool & Machine Co.: *See—*
Grow, Arthur Larry, 3,941,970.

Preisenhammer, Peter: *See—*
Arnold, Franz; and Preisenhammer, Peter, 3,941,362.

Pretema A.G.: *See—*
Unterreiner, Josef, 3,940,860.

Price, John H.; and Ruksenas, Miguel A., to Hudson Oxygen Therapy Sales Company. Gas diffusing assembly. 3,941,862, Cl. 261-122.000.

Princehouse, Joseph B., to Harris-Thomas Drop Forge Company, The. Apparatus and method for forging a bicycle crank. 3,940,969, Cl. 72-354.000.

Pringle, William L., to United States Steel Corporation. Disc brake rotor assembly. 3,941,221, Cl. 188-218.0XL.

Pringle, William L., to United States Steel Corporation. Door lock assembly. 3,941,411, Cl. 292-26.000.

Printronix, Inc.: *See—*
Barrus, Gordon B.; Emenaker, Leo J.; and Melissa, Raymond F., 3,941,051.

Proctor, William E.: *See—*
Eckfeldt, Edgar L.; Proctor, William E.; and Eynon, James U., 3,941,665.

Produits Chimiques Ugine Kuhlmann: *See—*
Foulletier, Louis; and Bertocchio, Rene, 3,941,705.

Proeger, Linden P.: *See—*
Shinville, Gerald T.; and Proeger, Linden P., 3,941,359.

Prouteau, Lucien: *See—*
Delisle, Jean-Paul; Pochard, Raymond; Porte, Robert; and Prouteau, Lucien, 3,941,652.

Pryor, Michael J.; Crane, Jacob; Friedman, Sam; and Shapiro, Eugene, to Olin Corporation. Method of processing copper base alloys. 3,941,620, Cl. 148-12.700.

Psychotherapeutic Devices, Inc.: *See—*
Kritzberg, Nathan I., 3,940,863.

Pullukat, Thomas J.; Shida, Mitsuzo; and Gillilan, Robert L., to Chemplex Company, a part interest. Method of polymerizing olefins. 3,941,761, Cl. 260-94.90D.

Puolustusministerio: *See—*
Huhta-Kowisto, Esko Ensio, 3,941,616.

Pusch, Gunter, to Deutsche Texaco Aktiengesellschaft. Method of consolidating unconsolidated or insufficiently consolidated formations. 3,941,191, Cl. 166-288.000.

Puskar, Victor, to Engelhard Minerals & Chemicals Corporation. Method for producing calcined clay pigments. 3,941,872, Cl. 423-331.000.

Putchinski, Leo J., Jr.: *See—*
Miller, Howard R.; Putchinski, Leo J., Jr.; and Vanderlei, Kenneth W., 3,941,949.

Puverel, Fernand: *See—*
Berrod, Francois; and Puverel, Fernand, 3,942,181.

Q-S Oxygen Processes, Inc.: *See—*
Queneau, Paul E.; and Schuhmann, Reinhardt, Jr., 3,941,587.

Quaker Oats Company, The: *See—*
Brindell, Gordon D.; and Wuskell, Joseph P., 3,941,850.
Wilbur, Charles J., 3,941,303.

Quante, Manfred: *See—*
Lauhoff, Theodor; Quante, Manfred; Stickel, Kurt Erwin; Bolz, Egon; and Semma, Klaus, 3,940,996.

Quasar Electronics Corporation: *See—*
Nakanishi, Mutsuo, 3,942,122.

Queneau, Paul E.; and Schuhmann, Reinhardt, Jr., to Q-S Oxygen Processes, Inc. Metallurgical process using oxygen. 3,941,587, Cl. 75-72.000.

R. E. Chapin Manufacturing Works, Inc.: *See—*
Yeager, William J., 3,940,843.

R-J Industries, Inc.: *See—*
Rausch, Donald L.; and Jacque, Donald A., 3,940,893.

Rabasse, Jean, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Series type adder for adding plural binary numbers. 3,941,990, Cl. 235-176.000.

Radcliffe, Allen: *See—*
Barrow, John Samuel; Radcliffe, Allen; and Taylor, Donald, 3,941,917.

Rae, Giles E.: *See—*
Danzer, Paul M.; and Rae, Giles E., 3,942,177.

Raeske, Frank J.: *See—*
Green, Sam J.; and Raeske, Frank J., 3,940,987.

Rahlff, Manfred: *See—*
Schilz, Wolfram; Rahlff, Manfred; Schmidt, Uwe Jurgen; Plass, Klaus Gottfried; and Schroder, Eckhard, 3,941,456.

Rajay Industries, Inc.: *See—*
MacInnes, Hugh; and Uitti, Paul M., 3,941,437.

Ralph, John R.: *See—*
Caton, Dolphus D.; and Ralph, John R., 3,941,072.

Rambauske, Werner R.: *See—*
McFarland, Philip J.; and Rambauske, Werner R., 3,941,459.
Merrow, Earle F.; Rambauske, Werner R.; and McFarland, Philip J., 3,941,458.

Rameau, Jean, to Regie Nationale des Usines Renault; and Automobiles Peugeot. Method and apparatus for attaching the exhaust manifold. 3,941,409, Cl. 285-137.00R.

Rank Xerox Ltd.: *See—*
Honjo, Satoru; and Miyatuka, Hajime, 3,941,594.
Takiguchi, Koichi, 3,941,558.

Rankins, Leon B. Boat flag holder. 3,941,340, Cl. 248-40.000.

Rannou, Jean; and Luther, William, to Thomson-CSF. Wide-band omnidirectional antenna. 3,942,180, Cl. 343-725.000.

Ranz, Erwin; Lapp, Otto; Moisar, Erik; and von Rintelen, Harald, to AGFA-Gevaert, A.G. Photographic material containing fogged, direct positive silver halide emulsion and negative silver halide emulsion for the production of equidensities. 3,941,595, Cl. 96-27.00E.

Rao, Ramachandra A.: *See—*
Swiatowiec, Frank J.; and Rao, Ramachandra A., 3,942,033.

Rasenberger, Otto, to L. Schuler GmbH. Apparatus for operating automatic conveyors. 3,941,240, Cl. 198-218.000.

Rauenbuehler, John A., to Cutler-Hammer, Inc. Method of making electrical contacts. 3,940,850, Cl. 29-630.00C.

Rauenbusch, Erich: *See—*
Huper, Fritz; Rauenbusch, Erich; Schmidt-Kastner, Gunter; Bomer, Bruno; and Bartl, Herbert, 3,941,756.

Rausch, Donald L.; and Jacque, Donald A., to R-J Industries, Inc. Building panel joint. 3,940,893, Cl. 52-90.000.

Raybestos-Manhattan Inc.: *See—*
Tavelle, Charles L.; and Wittschen, Robert F., 3,941,635.

Raymond Lee Organization, Inc., The: *See—*
Hughes, George A., 3,940,809.
Metzger, Jack D., 3,941,156.

Raytheon Company: *See—*
Luck, Clarence F., Jr.; and Bowness, Colin, 3,941,973.
MacMaster, George H.; and Dudley, Kenneth W., 3,941,968.
McFarland, Philip J.; and Rambauske, Werner R., 3,941,459.
Merrow, Earle F.; Rambauske, Werner R.; and McFarland, Philip J., 3,941,458.
Stout, Karl J., 3,942,011.

Razdan, Raj Kumar: *See—*
Harris, Louis Selig; Pars, Harry George; Razdan, Raj Kumar; and Sheehan, John Clark, 3,941,782.

RCA Corporation: *See—*
Ahmed, Adel Abdel Aziz, 3,941,940.
Hall, James Robert, 3,942,129.
Hernqvist, Karl Gerhard, 3,942,062.
Kutay, Robert Stephen; and Laughman, Kenneth Wentz, 3,942,133.
Larrabee, Robert Dean, 3,941,630.
Limberg, Allen LeRoy, 3,942,046.
Schade, Otto Heinrich, Jr., 3,942,134.
Shidlovsky, Igal, 3,941,715.

Re, Frank M., to Dual Manufacturing and Engineering Incorporated. Reclining chair. 3,941,417, Cl. 297-85.000.

Rea, William L.: *See—*
Terral, Leonard G.; Regelson, Ephraim; Sake, William E.; Matusiak, Ronald J.; and Rea, William L., 3,940,970.

Reale, Lucio V. Fulcrum tilt building system. 3,940,902, Cl. 52-745.000.

Recognition Equipment Incorporated: *See—*
Balko, Jack E.; Blair, John E.; Bybee, Jerry L.; Fuhrmeister, William F.; and Kushmaul, Richard T., 3,942,153.

Reed, Robert D., to John Zink Company. Velocity thermocouple. 3,940,988, Cl. 73-349.000.

Reenstra, Arthur L.: *See—*
Jost, Ernest M.; Reenstra, Arthur L.; and Trenkler, George, 3,940,992.

Reeves, Ronald L.: *See—*
Ehrhardt, Gerry H.; and Reeves, Ronald L., 3,941,608.

Regan, Robert James: *See—*
Haugsjaa, Paul Osborne; Nelson, William F.; Regan, Robert James; and McNeill, William Henry, 3,942,058.
Haugsjaa, Paul Osborne; McNeill, William Henry; Regan, Robert James; and Lech, Joseph Martin, 3,942,068.

Regel, Erik: *See—*
Draber, Wilfried; Regel, Erik; Buchel, Karl-Heinz; Eue, Ludwig; and Schmidt, Robert R., 3,941,800.

Regelson, Ephraim: *See—*
Terral, Leonard G.; Regelson, Ephraim; Sake, William E.; Matusiak, Ronald J.; and Rea, William L., 3,940,970.

Regie Nationale des Usines Renault: *See—*
Ballini, Andre, 3,941,497.
Dalencon, Andre, 3,941,273.
Giordano, Jean Louis; and Guettier, Michel, 3,941,431.
Leconte, Gilles, 3,941,203.
Rameau, Jean, 3,941,409.

Reiber, Hans, to International Standard Electric Corporation. Method and apparatus for transferring wide-band sound signals. 3,941,462, Cl. 352-12.000.

Reichert, Donald G., to A B C Packaging Machine Corporation. Case forming and transferring machine. 3,941,037, Cl. 93-51.00R.

Reichert, Konrad: *See—*
Kauferle, Josef; and Reichert, Konrad, 3,942,100.

Reichl, Eric H., to Consolidation Coal Company. Mobile slurry handling system. 3,941,425, Cl. 302-14.000.

Reimer, William A., to GTE Automatic Electric Laboratories Incorporated. Electrical terminal system. 3,941,443, Cl. 339-17.00C.

Renfrew, Edgar E.; and Zanella, Dominic A., to American Aniline Products, Inc. Trisazo polyester materials. 3,941,560, Cl. 8-41.00C.

Renfro, Kenneth W.; and Guhl, Richard E., to Caterpillar Tractor Co. Automatic control circuit for an electrically powered hydraulic pump. 3,940,931, Cl. 60-403.000.

Renoulin, Roger: *See—*
Jacob, Jean-Baptiste; Renoulin, Roger; and Le Drezen, Pierre, 3,941,947.

Renth, Ernst-Otto; Mentrup, Anton; Schromm, Kurt; and Danneberg, Peter, to Boehringer Ingelheim GmbH. N-Aryl-N'-(phenyl-or phenoxy-alkyl)-piperazines and salts thereof. 3,941,789, Cl. 260-268.0BC.

Republic Industries, Inc.: *See—*
Slaybaugh, Loren E., 3,940,887.

Research and Development Laboratories of Ohno Company Limited: *See—*
Ohno, Genji; Uchiyama, Tadamitsu; Ohki, Seisaku; and Morohashi, Hishao, 3,941,312.

Rexnord, Inc.: *See—*
Dieringer, Andrew M., 3,942,000.

Reynard, Remi: *See—*
Chatard, Michel; Grolet, Pierre; Reynard, Remi; and Thiery, Jean, 3,941,146.

Rheem Manufacturing Company: *See—*
Velarde, Clyde R.; and Williams, Henry G., 3,940,841.

Rheinstahl AG: *See—*
Albrecht, Erhard, 3,941,065.

Rhodes, Kevin J.: *See—*
Dimmick, George D.; Rhodes, Kevin J.; and Uzumecki, Richard W., 3,942,064.

Rhone-Poulenc Industries: *See—*
Mazarguil, Honore; Meiller, Francois; and Monsan, Pierre, 3,941,657.

Rhone Poulenc S.A.: *See—*
Fort, Jean-Francois; and Giraudon, Raymond, 3,941,798.

Rhone-Poulenc-Textile: *See—*
Couchoud, Paul; and Grimaud, Edouard, 3,941,860.

Ri, Zaisui. Process for storing electricity for a fast advancing conveyance and device for storing such electricity. 3,942,025, Cl. 290-55.000.

Riccardi, Guy J., to Bio-Derivatives Corporation. Recovery of L-Dopa from R-dopa containing materials. 3,941,835, Cl. 260-519.000.

Ricci, William S., to H. P. Bus Corporation of America. Wheel chair carrying minibus. 3,941,261, Cl. 214-85.000.

Rice, Robert D. Operating means for boats. 3,941,076, Cl. 115-12.00R.

Richard, William R., Jr.: *See—*
Herber, John F.; Richard, William R., Jr.; and Street, Robert W., 3,941,709.

Richardson, David A.; and Robinson, Robert J., to Foxboro Company, The. Positioning device using negative spring-rate tensioning means. 3,940,935, Cl. 60-528.000.

Richardson-Merrell Inc.: *See—*
Carr, Albert A.; and Kinsolving, C. Richard, 3,941,795.

Richter Gedeon Vegyeszeti Gyar Rt: *See—*
Hankovszky, Olga; Hideg, Kalman; and Pacsa, Sandor, 3,941,788.

Richter, Gerhard: *See—*
von Sturm, Ferdinand; and Richter, Gerhard, 3,941,135.

Rickard, Michael David: *See—*
Dawson, Peter Leonard; Rickard, Michael David; and Rothwell, Michael Tom, 3,941,713.

Ricoh Co., Ltd.: *See—*
Nagahara, Yasumori; and Suzuki, Kohji, 3,941,472.
Okamoto, Toyoo, 3,941,469.

Ridgeway, Rex L. Portable water bailing device for a boat. 3,941,073, Cl. 114-183.00R.

Ridley, Richard D.: *See—*
Burton, Robert S., III; Cha, Chang Yul; and Ridley, Richard D., 3,941,421.

Rieger, Hans Wolfhart: *See—*
Kugler, Tibor; and Rieger, Hans Wolfhart, 3,941,899.

Riemann, Volker: *See—*
Borner, Manfred; Glasmachers, Gisbert; Bernecker, Otto; Riemann, Volker; and Maslowski, Stefan, 3,941,945.

Riester, Hans, to Georg Fischer Aktiengesellschaft. Method of removing exhaust gases from plastic binded sand molds. 3,941,868, Cl. 423-210.000.

Rieter Machine Works Ltd.: *See—*
Bosshard, Peter; Portmann, Werner; and Wust, Olivier, 3,941,321.

Riggs, Lawrence H.; and Curn, William J. Pillion rider belt. 3,940,801, Cl. 2-311.000.

Rimar S.p.A.: *See—*
Vecchia, Gino Dalla, 3,941,897.

Robb, Raymond R.; and Sood, Vijay K., to Carrier Corporation. Rotor assembly. 3,941,506, Cl. 416-244.00A.

Roberge, James K.: *See—*
Ward, John E.; Silvey, John O.; and Roberge, James K., 3,940,979.

Robert Bosch G.m.b.H.: *See—*
Maisch, Wolfgang; and Rubel, Erich, 3,942,087.
Will, Gerhard, 3,941,016.

Robert Bosch Verpackungsmaschinen G.m.b.H.: *See—*
Moser, Theo; and Liede, Dieter, 3,941,248.

Robert, Eddie L. Blowout preventer locking apparatus and method. 3,941,141, Cl. 137-1.000.

Roberts, Eldon E. Artificial fishing lure. 3,940,869, Cl. 43-42.530.

Roberts, Thomas C., to Curtiss-Wright Corporation. Rotary engine with fuel supply through rotor. 3,941,098, Cl. 123-8.130.

Robertson, Harry H.; Hicks, Donnie H.; and Hofmann, Hugh M., to Ameron, Inc. Composite concrete and steel pallet for forming one end of concrete pipe. 3,941,347, Cl. 249-204.000.

Robertson Paper Box Co., Inc.: *See—*
Tyrseck, Walter J., 3,941,302.

Robins, Kenneth E.: *See—*
McMackin, Raymond F.; Britton, Richard B.; and Robins, Kenneth E., 3,940,819.

Robinson, Donovan L., to General Motors Corporation. Gas turbine engine power shift transmission power train. 3,941,015, Cl. 74-856.000.

Robinson, Hugh A.: *See—*
Menzin, Marvin; and Robinson, Hugh A., 3,941,440.

Robinson, Robert J.: *See—*
Richardson, David A.; and Robinson, Robert J., 3,940,935.

Roche, Michael F., to United States of America, Energy Research and Development Administration. Device for determining carbon activity through pressure. 3,941,566, Cl. 23-230.00R.

Rock, Edward J.: *See—*
Bjorksten, Johan; and Rock, Edward J., 3,941,182.

Rockwell International Corporation: *See—*
McCloskey, Albert R., 3,940,836.

Rockwell, Lynn A., to General Motors Corporation. Ignition distributor rotor. 3,941,107, Cl. 123-146.50A.

Rodewald, Newell C.; and Sinor, Jerry E. Recirculating breathing apparatus and method. 3,941,124, Cl. 128-142.000.

Rogers, Stephen C., Jr.: *See—*
Gibson, Harry S., Jr.; and Rogers, Stephen C., Jr., 3,941,027.

Rohles, John H.: *See—*
Hjelm, Victor S.; and Rohles, John H., 3,941,364.

Rollei-Werke Franke & Heidecke: *See—*
Waaske, Heinz, 3,941,464.

Romanenko, Vitaly Ivanovich; Kuznetsov, Sergei Ivanovich; and Korenkov, Vladimir Nikolaevich. Method of biological purification of industrial effluents from chromates and bichromates. 3,941,691, Cl. 210-2.000.

Romoli, Luciano, to Billi S.p.A. Electrical supervisory circuit arrangements. 3,940,954, Cl. 66-157.000.

Ronafoldi, Arnold; and Zoltan, Istvan, to Csongradmengyei Tanacs Vegyesiparm Szolgaltato Vallalat. Standing wave metallizing apparatus for coating a substrate with molten metal. 3,941,088, Cl. 118-620.000.

Roncan, Riccardo, to Italsider S.p.A. Fluid doctor blade. 3,941,086, Cl. 118-63.000.

Rookus, James E. Hair-raising panel for electric razor. 3,940,851, Cl. 30-34.200.

Root, James R., to Ruskin Manufacturing Company. Damper construction and spring. 3,941,179, Cl. 160-84.00R.

Rop, James O.: *See—*
Black, James A.; and Rop, James O., 3,941,053.

Rosander, Russell B., to Package Machinery Company. Hydraulic system for injection molding machine. 3,940,930, Cl. 60-375.000.

Roscoe, Theodore J., Jr.: *See—*
Curington, Alfred R.; and Roscoe, Theodore J., Jr., 3,941,196.

Rosenbeck, Gary L. End clip for blade refills. 3,940,823, Cl. 15-250.420.

Rosenberg, Eugene: *See—*
Gutnick, David; and Rosenberg, Eugene, 3,941,692.

Rosenblatt, Gordon: *See—*
Nigol, Olaf; and Rosenblatt, Gordon, 3,941,918.

Rosendahl, Friedrich-Karl: *See—*
Hermann, Gunther; Hoffmann, Peter; Rosendahl, Friedrich-Karl; and Ugi, Ivar, 3,941,887.

Roster, Theodore J.: *See—*
Bayles, John J.; and Roster, Theodore J., 3,940,814.

Rotaru, Cornel Constantin N., to Centrala Industriala de Fibre Chimice. Process for producing ketoximes. 3,941,840, Cl. 260-566.00A.

Roth, Clarence Edward, Jr.; Lasswell, Joseph Arnold; Bybee, William Dennis; and Parker, Earl Brewer, Jr., to Gulf Oil Corporation. Olefin polymer compositions stabilized against discoloration. 3,941,747, Cl. 260-45.95H.

Roth, Michael: *See—*
Bosch, Erhard; Pirson, Ewald; and Roth, Michael, 3,941,864.

Rothwell, Jack L.; and Warren, Williams S., to General Motors Corporation. Air brake wheel lock control valve mechanism. 3,941,428, Cl. 303-21.00F.

Rothwell, Michael Tom: *See—*
Dawson, Peter Leonard; Rickard, Michael David; and Rothwell, Michael Tom, 3,941,713.

Roussel-UCLAF: *See—*
Vignau, Michel, 3,941,811.

Royer, Odile: *See—*
Spitz, Erich; Huignard, Jean Pierre; and Royer, Odile, 3,941,450.

Rubel, Erich: *See—*
Maisch, Wolfgang; and Rubel, Erich, 3,942,087.

Rudy, Hans, heir: *See—*
Hustede, Helmut; Rudy, Hermann, deceased; Rudy, Liselotte, nee Ringelmann, heir; Rudy, Hans, heir; and Sallewsky, Barbara, nee Rudy, heir, 3,941,656.

Rudy, Hermann, deceased: *See—*
Hustede, Helmut; Rudy, Hermann, deceased; Rudy, Liselotte, nee Ringelmann, heir; Rudy, Hans, heir; and Sallewsky, Barbara, nee Rudy, heir, 3,941,656.

Rudy, Liselotte, nee Ringelmann, heir: *See—*
Hustede, Helmut; Rudy, Hermann, deceased; Rudy, Liselotte, nee Ringelmann, heir; Rudy, Hans, heir; and Sallewsky, Barbara, nee Rudy, heir, 3,941,656.

Rueff, Herbert: *See—*
Aiuola, Franco; and Rueff, Herbert, 3,941,233.

Ruf, Ernest H., deceased; and by Ruf, Norma J., executrix. Portable hand-held power-operated sheet cutting device. 3,940,852, Cl. 30-241.000.

Ruf, Norma J., executrix: *See—*
Ruf, Ernest H., deceased; and Ruf, Norma J., executrix, 3,940,852.

Ruksenas, Miguel A.: *See—*
Price, John H.; and Ruksenas, Miguel A., 3,941,862.

Rupenian, Emanuel A. Pedal powered amphibian tricycle with blower-turbine coupling means. 3,941,075, Cl. 115-2.000.

Rusbuldt, Horst: *See—*
Delin, Heinz; and Rusbuldt, Horst, 3,941,956.

Ruskin Manufacturing Company: *See—*
Root, James R., 3,941,179.

Russ, Malcolm J., to Motorola, Inc. Monolithic, milticolor, light emitting diode display device. 3,942,065, Cl. 313-500.000.

Russell, James T., to Battelle Development Corporation. Optical fiber deflection device. 3,941,927, Cl. 178-7.600.

Russell, Ralph Thomas: *See—*
Smith, Raymond Anthony; and Russell, Ralph Thomas, 3,941,896.

Russo, Adolph D., to Russo Ornamental Iron Products, Inc. Panel supporting frame assembly. 3,940,900, Cl. 52-656.000.

Russo Ornamental Iron Products, Inc.: *See—*
Russo, Adolph D., 3,940,900.

Rutledge, William W.: *See—*
Swedenberg, Clyde J.; Fain, Charles C.; and Rutledge, William W., 3,941,632.

Rutten, Michael R.: *See—*
Balamuth, Lewis; Rutten, Michael R.; and Meyer, Robert, 3,941,424.

S.R.M. Hydromekanik Aktiebolag: *See—*
Ahlen, Karl Gustav, 3,940,947.

S.T.B. Engineering Limited: *See—*
Ballinger, Maurice Gordon; and Oakerbee, Raymond Mitchell, 3,941,318.

Saab-Scania Aktiebolay: *See—*
Hardmark, Ragnar Malcus; and Kornbrink, Hans Folke Georg, 3,940,945.

Sadamatsu, Shigeru; and Nozaki, Toll, to Fuji Xerox Co., Ltd. Developing method utilizing pulverized, colored, crosslinked, vinylic polymer resin as toner. 3,941,898, Cl. 427-18.000.

Sadeski, Boleslaus J.: *See—*
Balch, James L.; Anderson, James E.; and Sadeski, Boleslaus J., 3,941,234.

Saegusa, Hitoshi; and Yoshitake, Masami, to Mitsui Shipbuilding and Engineering Co., Ltd. Process for converting inferior heavy oil into light oil and gasifying the same. 3,941,681, Cl. 208-107.000.

Saeva, Franklin D., to Xerox Corporation. Liquid crystalline image converter. 3,942,007, Cl. 250-331.000.

Safe Flight Instrument Corporation: *See—*
Greene, Leonard M., 3,940,983.

Safe Rack, Inc.: *See—*
Gordon, Roger G., 3,941,227.

Saguaro Industries, Inc.: *See—*
Gillespie, John Francis, 3,941,533.

St. Germain, Dennis. Safety belt construction. 3,941,208, Cl. 182-3.000.

Saitoh, Kozo; and Izumi, Sumio, to Mitsui Mining & Smelting Co., Ltd. Method for separation of mixture of polyester and cellulose derivative. 3,941,688, Cl. 209-166.000.

Sakai, Kunio: *See—*
Nonaka, Kohei; Fukushima, Masayoshi; and Sakai, Kunio, 3,940,999.

Sakashita, Tatsuo: *See—*
Goto, Kuniaki; and Sakashita, Tatsuo, 3,941,706.

Sake, William E.: *See—*
Terral, Leonard G.; Regelson, Ephraim; Sake, William E.; Matusiak, Ronald J.; and Rea, William L., 3,940,970.

Sako, Eiji; and Sasamoto, Hisasi, to Green Cross Corporation, The. Medical appliance made of plastic. 3,940,802, Cl. 3-1.400.

Salaverri, Javier Arostegui: *See—*
Aldecoa, Ramon Zubiaga; Lacombe, Arturo Aldecoa; Carles, Jose Maria Zubiaga; Salaverri, Javier Arostegui; and Borde, Damaso Urruticoechea, 3,941,071.

Salce, Ludwig; and Schoenewaldt, Erwin F., to Merck & Co., Inc. Process for preparing substituted nitroimidazoles. 3,941,801, Cl. 260-309.000.

Sallewsky, Barbara, nee Rudy, heir: *See—*
Hustede, Helmut; Rudy, Hermann, deceased; Rudy, Liselotte, nee Ringelmann, heir; Rudy, Hans, heir; and Sallewsky, Barbara, nee Rudy, heir, 3,941,656.

Salmond, William G., to Sandoz, Inc. 1,4-Disubstituted-5,8-methanotetrahydro-quinazolinones. 3,941,787, Cl. 260-251.00A.

Saltzer, Benjamin A.: *See—*
Booth, Newell O.; Saltzer, Benjamin A.; Thorn, James V.; and Sutton, Jerry L., 3,942,150.

Saltzman, Robert S., to Du Pont de Nemours, E. I., and Company. Method and apparatus for detecting hexavalent chromium. 3,941,563, Cl. 23-230.00R.

Salzman, Gerhard Martin: *See—*
King, William James; Murray, Leo Thomas; and Salzman, Gerhard Martin, 3,941,877.

Samcoe Holding Corporation: *See—*
Frezza, Robert, 3,941,326.

Sanda, Joseph C., Jr.: *See—*
Barbin, William W.; and Sanda, Joseph C., Jr., 3,941,740.

Sandoz, Inc.: *See—*
Houlihan, William J.; and Nadelson, Jeffrey, 3,941,888.
Salmond, William G., 3,941,787.
Simpson, William R., 3,941,797.

Sandoz Ltd., (Sandoz AG): *See—*
Koch, Werner, 3,941,780.
Mueller, Curt; and Schmid, Hans-Rudolf, 3,941,778.

Sankey, George H ; and Whiting, Keith D. E., to Minnesota Mining and Manufacturing Company. α-(Hydroxy and alkoxy substituted)phenyl-α-(2-piperidinyl)-methanols. 3,941,796, Cl. 260-293.840.

Sankyo Company Limited: *See—*
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Toda, Toshimasa; Mori, Eiko; Horiuchi, Hideo; Higashida, Susumu; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohata, Noriyuki; and Ohsawa, Hisayou, 3,941,744.

Santora, Norman Julian: *See—*
Diamond, Julius; and Santora, Norman Julian, 3,941,821.

Santucci, Nicola, to Nuovo Pignone S.p.A. Electronic device for automatically and continuously adjusting the height of a shearing pile of textile articles having a differing thickness. 3,941,986, Cl. 235-151.100.

Sanwa Kagaku Kenkyusho Co., Ltd.: *See—*
Kasahara, Nobuo; Shiota, Asao; and Kitaguchi, Isamu, 3,940,883.

Sarantakis, Dimitrios, to American Home Products Corporation. pGlu-D-Met-Trp-Ser-Tyr-D-Ala-Leu-Arg-Pro-Gly-NH_2 and intermediates. 3,941,763, Cl. 260-112.5LH.

Saretzky, Horst, to De Limon Fluhme & Co. Oil mist lubricating system and condenser device. 3,941,210, Cl. 184-6.210.

Sarkes Tarzian, Inc.: *See—*
Busch, Albert E.; and Hotsenpiller, John R., 3,941,925.

Sasaki, Kouji; Nakano, Seizo; and Tsubaki, Tohru, to Hitachi, Ltd. Circuit breaker. 3,941,963, Cl. 200-148.00A.

Sasaki, Kyoichi: *See—*
Sumi, Momoki; Kanda, Goro; Iriguchi, Norio; Isohata, Susumu; and Sasaki, Kyoichi, 3,941,967.

Sasame, Takao; and Yagi, Toshio, to Toyo Kogyo Co., Ltd. Method for making ferrous metal having improved resistances to corrosion at elevated temperatures and to oxidization. 3,941,569, Cl. 29-183.500.

Sasamoto, Hisasi: *See—*
Sako, Eiji; and Sasamoto, Hisasi, 3,940,802.

Sato, Masao; and Majima, Hideji, to Amada Company Ltd. Horizontal band sawing machine suited for cutting steel sections like H-shaped steel. 3,941,022, Cl. 83-796.000.

Sato, Mutumi: *See—*
Kawase, Katsuyuki; Sato, Mutumi; Hamada, Kuniaki; and Hayashi, Seiji, 3,941,985.

Sato, Reiji, to Amano Corporation. Recording device. 3,942,182, Cl. 346-53.000.

Saumsiegle, Robert W.; and Harry, Ieuan L., to Continental Can Company, Inc. Injection blow molding apparatus and method. 3,941,539, Cl. 425-242.00B.

Saunders, James H.: *See—*
Chapman, Richard D.; Holmer, Donald A.; Pickett, Oscar A., Jr.; and Saunders, James H., 3,941,755.

Saurer-Allma GmbH, Allgaeuer Maschinenbau: *See—*
Arnold, Franz; and Preisenhammer, Peter, 3,941,362.

Sawazaki, Masatoshi, to Precision Fukuhara Works, Ltd. Lever needle selecting means for circular knitting machines. 3,940,950, Cl. 66-50.00R.

Sayer, Wayne L.; and Wright, Pat. Method for locating and evaluating geothermal sources of energy by sensing electrostatic voltage gradients. 3,942,101, Cl. 324-1.000.

Schade, Otto Heinrich, Jr., to RCA Corporation. Astable multivibrator. 3,942,134, Cl. 331-113.00R.

Schaedla, William Hugh, to United States of America, Air Force. Short depth hardened waveguide launcher assembly element. 3,942,138, Cl. 333-21.00R.

Schatka, Gunther; Kruger, Wilm; Paulus, Rudolf; Koleff, Boris; Pattis, Erich; and Hartwig, Karl, to AGFA-GEVAERT, A.G. Electrophotographic copier with safety arrangement for preventing damage to copying material in fixing arrangement during copier malfunction. 3,941,471, Cl. 355-3.00R.

Schatz, Douglas S., to Applied Materials, Inc. RF Power transmission line. 3,941,966, Cl. 219-10.490.

Schatz, Joseph S., to Wolf X-Ray Corporation. Film cassette. 3,942,016, Cl. 250-475.000.

Scheerhorn, Douglas, to Steelcase Inc. Drawer interlock system. 3,941,441, Cl. 312-215.000.

Scheidl, Helmut, to Siemens Aktiengesellschaft. Tube spacer grid for a heat-exchanger tube bundle. 3,941,188, Cl. 165-162.000.

Scheidt, Eugen: *See*—
Klement, Gunter; Baumann, Horst; and Scheidt, Eugen, 3,941,907.

Schering Aktiengesellschaft: *See*—
Brinkmann, Bernd; and Griebsch, Eugen, 3,941,753.

Schering Corporation: *See*—
Gold, Elijah H., 3,941,885.

Scheu Manufacturing Company: *See*—
Bedford, Robert E., 3,941,553.

Scheuermann, Horst: *See*—
Hell, Renate Elisabeth; and Scheuermann, Horst, 3,941,791.

Schibilla, Eduard: *See*—
Von Semel, Georg; Schibilla, Eduard; and Strewe, Wolfgang, 3,941,667.

Schick, Hans: *See*—
Herbeck, Rudolf; Kolk, Erich; Schweier, Guenther; Schick, Hans; and Urban, Friedrich, 3,941,760.

Schick, Lloyd Alan: *See*—
Fader, Marshall Lloyd; and Schick, Lloyd Alan, 3,941,564.

Schiemann, Heinz: *See*—
Hermstein, Wolfgang; and Schiemann, Heinz, 3,942,106.

Schilz, Wolfram; Rahlff, Manfred; Schmidt, Uwe Jurgen; Plass, Klaus Gottfried; and Schroder, Eckhard, to U.S. Philips Corporation. Device for reducing the granulation in the transmission of optical information by means of a highly coherent beam of radiation. 3,941,456, Cl. 350-161.000.

Schindehutte, Manfred; and Dieling, Hans, to Wegmann & Co. Pneumatic railway car suspension. 3,941,061, Cl. 105-135.000.

Schlaeppi, Rene: *See*—
Maillefer, Charles E.; and Schlaeppi, Rene, 3,941,329.

Schlegel Corporation: *See*—
Buonanno, Samuel S., 3,941,543.

Schluderberg, Donald C.: *See*—
Jabsen, Felix S.; Schluderberg, Donald C.; and Paulson, Arnold E., 3,941,187.

Schmeling, Gerhard: *See*—
Bison, Gunter; Schubel, Hans; and Schmeling, Gerhard, 3,941,814.

Schmelzle, Christian G.: *See*—
Nicolas, Nabil Y.; and Schmelzle, Christian G., 3,941,067.

Schmid, Hans-Rudolf: *See*—
Mueller, Curt; and Schmid, Hans-Rudolf, 3,941,778.

Schmid, Wolfgang, to Dr. -Ing. H.c.F. Porsche Aktiengesellschaft. Arrangement for mounting a fuel injection nozzle. 3,941,109, Cl. 123-139.0AW.

Schmidt-Dunker, Manfred: *See*—
Ploger, Walter; Schmidt-Dunker, Manfred; and Gloxhuber, Christian, 3,941,772.

Schmidt-Kastner, Gunter: *See*—
Huper, Fritz; Rauenbusch, Erich; Schmidt-Kastner, Gunter; Bomer, Bruno; and Bartl, Herbert, 3,941,756.

Schmidt, Otto: *See*—
Diepers, Heinrich; and Schmidt, Otto, 3,940,848.

Schmidt, Paul Gordon, to Du Pont de Nemours, E. I., and Company. TiO_2 Pigment for industrial paints based on water reducible systems. 3,941,603, Cl. 106-300.000.

Schmidt, Robert R.: *See*—
Draber, Wilfried; Regel, Erik; Buchel, Karl-Heinz; Eue, Ludwig; and Schmidt, Robert R., 3,941,800.

Schmidt, Uwe Jurgen: *See*—
Schilz, Wolfram; Rahlff, Manfred; Schmidt, Uwe Jurgen; Plass, Klaus Gottfried; and Schroder, Eckhard, 3,941,456.

Schmitt, Helwig. Harvesters. 3,940,911, Cl. 56-14.600.

Schmitter, Andre; Hugi, Rolf; and Seiz, Wolfgang, to Ciba-Geigy Corporation. Process for the manufacture of epoxide resin foams. 3,941,725, Cl. 260-2.5EP.

Schmitz, Harry W.: *See*—
Fennessy, Donald W.; and Schmitz, Harry W., 3,941,532.

Schnabel, Horst: *See*—
Mitzlaff, Michael; and Schnabel, Horst, 3,941,666.

Schnabel, Wilhelm J.: *See*—
Babiec, John S., Jr.; and Schnabel, Wilhelm J., 3,941,822.

Schneider, Heinz, to Zimmermann & Jansen GmbH. Water-cooled high-temperature slide valve, especially hot blast slide valve. 3,941,186, Cl. 165-47.000.

Schneider, Irwin, to United States of America, Navy. Method of testing alkali halide crystals with anisotropic centers. 3,941,482, Cl. 356-114.000.

Schnier, Edward A., to A-T-O, Inc. Driven transfer roll for labeling machine. 3,941,642, Cl. 156-297.000.

Schnyder, Auxilius P. Continuous digester. 3,941,650, Cl. 162-237.000.

Schoch, Robert, to Weinmann Aktiengesellschaft. Bicycle brake adjusting apparatus. 3,941,215, Cl. 188-24.000.

Schodl, Richard, to Deutsche Forschungs-und Versuchsanstalt fur Luft-und Raumfahrt E.V. Measuring device for the measurement of fluid flow rates. 3,941,477, Cl. 356-28.000.

Schoen, Lowhardt A. A.; and Busschers, Franciscus A., to Stamicarbon, B.V. Process for improving the adhesive properties of ethylene-propylene co- and terpolymers. 3,941,909, Cl. 428-424.000.

Schoenewaldt, Erwin F.: *See*—
Salce, Ludwig; and Schoenewaldt, Erwin F., 3,941,801.

Schroder, Eckhard: *See*—
Schilz, Wolfram; Rahlff, Manfred; Schmidt, Uwe Jurgen; Plass, Klaus Gottfried; and Schroder, Eckhard, 3,941,456.

Schromm, Kurt: *See*—
Renth, Ernst-Otto; Mentrup, Anton; Schromm, Kurt; and Danneberg, Peter, 3,941,789.

Schubel, Hans: *See*—
Bison, Gunter; Schubel, Hans; and Schmeling, Gerhard, 3,941,814.

Schuhbauer, Albert; and Hieber, Otto, to Alfred Kunz & Co. Method for production of a surface layer for traffic areas and the like. 3,941,607, Cl. 106-281.00R.

Schuhmann, Reinhardt, Jr.: *See*—
Queneau, Paul E.; and Schuhmann, Reinhardt, Jr., 3,941,587.

Schulte, Walter: *See*—
Pelz, Willibald; Credner, Hans-Heinrich; Schulte, Walter; Klein, Alfons; Wedemeyer, Karlfried; and Nittel, Fritz, 3,941,601.

Schultenkamper, Josef, to Gelenkwellenbau GmbH. Universal joint shaft. 3,940,948, Cl. 64-17.00R.

Schurger, Rainer; Burkl, Erich; and Walter, Lothar, to SKF Industrial Trading and Development Company, B.V. Hydrostatic bearing. 3,941,434, Cl. 308-9.000.

Schuster, Friedrich, to Kugelfischer Georg Schafer & Co. False twister. 3,940,914, Cl. 57-77.400.

Schutte, Hendrik, to Air-O-Mulder B.V. Hot water supply system. 3,941,118, Cl. 126-362.000.

Schwartz, Harold Gordon, to Du Pont de Nemours, E. I., and Company. Safety tire. 3,941,176, Cl. 152-340.000.

Schwartz, Henry D. Clinical testing means and methods. 3,941,565, Cl. 23-230.00B.

Schwarz, Wilhelm: *See*—
Hoffmeister, Bernhard; and Schwarz, Wilhelm, 3,941,259.

Schwarzmann, Matthias: *See*—
Broecker, Franz Josef; Zirker, Guenter; Triebskorn, Bruno; Marosi, Laszlo; Schwarzmann, Matthias; Dethlefsen, Winfried; and Kaempfer, Knut, 3,941,721.

Schweier, Guenther: *See*—
Herbeck, Rudolf; Kolk, Erich; Schweier, Guenther; Schick, Hans; and Urban, Friedrich, 3,941,760.

Schweizer, Ernst: *See*—
Ilvespaa, Atso; Gagneux, Andre; Schweizer, Ernst; and Frei, Jorg, 3,941,804.

Schwenninger, Ronald L., to PPG Industries, Inc. Method and apparatus for making molten glass. 3,941,577, Cl. 65-136.000.

SCM Corporation: *See*—
Eaton, John L.; Fagan, John C.; and Eeckhout, Roger V., 3,941,518.
Gribble, Peter R.; and Denino, Edward V., 3,941,315.
Hall, Richard C.; Kidd, Norman D.; and Daravingas, George V., 3,941,894.

Scoggin, Jack S., to Phillips Petroleum Company. Control for diluent removal from poly(arylene sulfide) reactor product. 3,941,664, Cl. 203-1.000.

Scott, Gary M.: *See*—
Petty, Preston L.; Harreld, Albert F.; and Scott, Gary M., 3,941,994.

Scott Paper Company: *See*—
Milewski, Stephen Mark, 3,942,080.

Scott, Paul R., to Shell Oil Company. Process for reducing the adherence of oil to siliceous material. 3,941,694, Cl. 210-40.000.

Sebenda, Jan: *See*—
Bukac, Zbynek; and Sebenda, Jan, 3,941,754.

Seguchi, Tadao: *See*—
Machi, Sueo; Suwa, Takeshi; Takehisa, Masaaki; and Seguchi, Tadao, 3,941,671.

Seifert, Richard, to Motoren-und Turbinen-Union Friedrichshafen GmbH. Cylinder-crankcase structure of cast housing elements connected in series. 3,941,114, Cl. 123-195.00R.

Seiz, Wolfgang: *See*—
Schmitter, Andre; Hugi, Rolf; and Seiz, Wolfgang, 3,941,725.

Seki, Kunio; and Kontani, Ryozo, to Hitachi, Ltd. Constant-voltage circuit. 3,942,128, Cl. 330-22.000.

Sekiguchi, Sadao: *See*—
Tajima, Shigeru; Shimamura, Takeshi; Matsumoto, Kojiro; Sekiguchi, Sadao; Yamagoshi, Tanoshi; and Fjieda, Kazumasa, 3,941,912.

Sekiguchi, Tomoaki, to Yamaha Hatsudoki Kabushiki Kaisha. Ignition system for internal combustion engines. 3,941,110, Cl. 123-148.0CC.

Selin, Terry G.: *See*—
De Zuba, George P.; Berger, Abe; and Selin, Terry G., 3,941,741.

Selkirk Metalbestos: *See*—
Nicolas, Nabil Y.; and Schmelzle, Christian G., 3,941,067.

Semenov, Petr Pavlovich: *See*—
Osipov, Anatoly Alexandrovich; Pekov, Nikolai Semenovich; and Semenov, Petr Pavlovich, 3,941,292.

Semi, Inc.: *See*—
Dunn, William C., 3,942,164.

Semma, Klaus: *See*—
Lauhoff, Theodor; Quante, Manfred; Stickel, Kurt Erwin; Bolz, Egon; and Semma, Klaus, 3,940,996.

Semmler, Eduard O.; Guthling, Klaus; and Meyer, Adolf J. G., to Barenschee, Wilhelm. Carrier for flexible printing plates. 3,941,055, Cl. 101-415.100.

Senjo, Teizo: *See*—
Uchiyama, Hisashi; Meno, Naohiko; Senjo, Teizo; and Kobayashi, Makio, 3,941,572.

Seruga, Edward A.: *See—*
Krause, Marvin W.; Strobel, Donald H.; and Seruga, Edward A., 3,940,971.
Service National dit: Gaz de France: *See—*
Cornil, Jean-Philippe, 3,941,144.
Servo Corporation of America: *See—*
Knudsen, Will B., 3,941,338.
Seton Company: *See—*
Wang, Tsu-Huai; and Key, Edgar T., 3,941,633.
Seufer, Theo; and van Basshuysen, Richard, to Audi NSU Auto Union Aktiengesellschaft; and Wankel GmbH. Rotary combustion engine having improved ignition means. 3,941,097, Cl. 123-8.090.
Seymour, Robert John: *See—*
Dougherty, Joseph Patrick; Kurtz, Stewart K.; and Seymour, Robert John, 3,941,478.
Shah, Naginchand A., to Xerox Corporation. Toner particle dispenser. 3,941,470, Cl. 355-3.0DD.
Shah, Rashmikant P., to Bell & Howell Company. Vernier carriage control. 3,941,466, Cl. 353-27.00R.
Shank, Wayne C., to Avco Corporation. Diffuser including a rotary stage. 3,941,501, Cl. 415-147.000.
Shannon, Richard E.: *See—*
Oglander, Allen H.; and Shannon, Richard E., 3,941,278.
Shapiro, Eugene; and Crane, Jacob, to Olin Corporation. Process for improving the elongation of grain refined copper base alloys containing zinc and aluminum. 3,941,619, Cl. 148-11.50R.
Shapiro, Eugene: *See—*
Pryor, Michael J.; Crane, Jacob; Friedman, Sam; and Shapiro, Eugene, 3,941,620.
Sharples, Thomas D.: *See—*
Ehret, Robert J.; Stephens, Donald E.; Durland, Douglas H.; and Sharples, Thomas D., 3,941,487.
Sharps Associates: *See—*
Harris, Louis Selig; Pars, Harry George; Razdan, Raj Kumar; and Sheehan, John Clark, 3,941,782.
Shaw, Richard G.: *See—*
Miller, Walter A.; Shaw, Richard G.; and King, Paul A., 3,941,865.
Shawver, Bruce M.: *See—*
Johnson, Melvin L.; and Shawver, Bruce M., 3,941,413.
Sheehan, John Clark: *See—*
Harris, Louis Selig; Pars, Harry George; Razdan, Raj Kumar; and Sheehan, John Clark, 3,941,782.
Sheets, Ronald E., to Tamarack Scientific Co., Inc. Optical microcircuit printing system. 3,941,475, Cl. 355-78.000.
Shell Oil Company: *See—*
Scott, Paul R., 3,941,694.
Shepherd, Thomas H.; and Gould, Francis E., to National Patent Development Corporation. Hydrophilic polymers, articles and methods of making same. 3,941,858, Cl. 260-885.000.
Sherer, R. Bruce: *See—*
Traube, John Harry; and Sherer, R. Bruce, 3,941,153.
Shevlin, Edward J., to Chattem Drug & Chemical Company. Bath beads containing allantoin. 3,941,722, Cl. 252-524.000.
Shibata, Yukitake: *See—*
Yamasaki, Hiroo; Ito, Ichizo; and Shibata, Yukitake, 3,940,986.
Shiber, Samuel, to MacLean-Fogg Lock Nut Company. Speed limiting accessory drive system and apparatus therefor. 3,941,225, Cl. 192-104.00C.
Shida, Mitsuzo: *See—*
Pullukat, Thomas J.; Shida, Mitsuzo; and Gillilan, Robert L., 3,941,761.
Shida, Sankichi: *See—*
Todoroki, Tsunehiko; and Shida, Sankichi, 3,940,964.
Shidlovsky, Igal, to RCA Corporation. Substituted zirconium pyrophosphate phosphors. 3,941,715, Cl. 252-301.40P.
Shields, Roger W., to Jab Company, Inc. Paging intercommunication system. 3,941,933, Cl. 179-1.00H.
Shiki, Haruo, to Nippon Electric Company Limited. Delay time controller for use in a group-delay equalizer. 3,942,118, Cl. 325-303.000.
Shimadzu Seisakusho Ltd.: *See—*
Akiyama, Junichi, 3,941,678.
Nishimura, Kaoru, 3,940,862.
Shimamura, Takeshi: *See—*
Tajima, Shigeru; Shimamura, Takeshi; Matsumoto, Kojiro; Sekiguchi, Sadao; Yamagoshi, Tanoshi; and Fjieda, Kazumasa, 3,941,912.
Shimizu, Nobuyuki: *See—*
Yamamoto, Shizuo; Nagai, Yuichi; Shimizu, Nobuyuki; and Tajimi, Hiroshi, 3,940,895.
Shin, Bok Kyoon: *See—*
Park, Yoon Soo; and Shin, Bok Kyoon, 3,940,847.
Shin, Keiichiro; Ozeki, Hiroshi; and Kurio, Noriyuki, to Nippon Piston Ring Co., Ltd. Multiple oil seal arrangement for rotary piston internal combustion engine. 3,941,523, Cl. 418-91.000.
Shinville, Gerald T.; and Proeger, Linden P., to Northwestern Steel and Wire Company. Apparatus for direct reduction of iron oxides. 3,941,359, Cl. 266-24.000.
Shiota, Asao: *See—*
Kasahara, Nobuo; Shiota, Asao; and Kitaguchi, Isamu, 3,940,883.
Shioyama, Hitoshi: *See—*
Kano, Motomi; Shioyama, Hitoshi; Takeuti, Yasuhito; and Niikawa, Masahiro, 3,941,974.
Shipp, Kathryn G.; and Kaplan, Lloyd A., to United States of America, Navy. Substituted polynitro-diphenylmethanes. 3,941,853, Cl. 260-645.000.
Shoemaker, Paul W. Ground tilling apparatus. 3,941,193, Cl. 172-106.000.
Short, George E., to G. D. Searle & Co. Method for use of 11-lower alkyl steroids. 3,941,880, Cl. 424-241.000.
Shugart Associates, Inc.: *See—*
Dalziel, Warren L., 3,941,052.
Siegel, Howard M.: *See—*
Lee, Leonard S.; Sopp, Samuel W.; and Siegel, Howard M., 3,941,621.
Siemens Aktiengesellschaft: *See—*
Diepers, Heinrich; and Schmidt, Otto, 3,940,848.
Druminski, Manfred, 3,941,647.
Freygang, Hans-Joachim; and Kovacs, Gabor, 3,942,099.
Haass, Adolf, 3,942,098.
Hermstein, Wolfgang; and Schiemann, Heinz, 3,942,106.
Heynisch, Hinrich; and Veith, Werner, 3,942,136.
Kohler, Werner; and Steinemer, Norbert, 3,941,959.
Kopplin, Horst, 3,941,961.
Kristen, Reiner; and Liska, Manfred, 3,942,054.
Kuhn, Klaus Roland; and Stigler, Viktor, 3,942,102.
Liska, Manfred; and Grunleitner, Johann, 3,942,081.
Olsen, Willi; Lieske, Manfred; Ehmann, Wolfgang; Krause, Dieter; and Perst, Gerhard, 3,942,030.
Pollmann, Fritz; and Holzer, Wilhelm, 3,942,143.
Scheidl, Helmut, 3,941,188.
Stut, Hans; and Barowski, Gerhard, 3,941,900.
von Sturm, Ferdinand; and Richter, Gerhard, 3,941,135.
Weibelzahl, Manfred, 3,942,091.
Sienkiewicz, Gerald Carl: *See—*
Matuck, George Coleman; Sienkiewicz, Gerald Carl; and Thorne, William Duncan, 3,941,231.
Sievers, Albert H.; and Sievers, Isabelle R. Portable farrowing bed. 3,941,093, Cl. 119-20.000.
Sievers, Isabelle R.: *See—*
Sievers, Albert H.; and Sievers, Isabelle R., 3,941,093.
Sievers, William O. Selective volume flush valve. 3,940,805, Cl. 4-67.00A.
Siewert, Robert M.: *See—*
Pozniak, Donald J.; and Siewert, Robert M., 3,940,928.
Sifniades, Stylianos; Boyle, William J., Jr.; and Van Peppen, Jan F., to Allied Chemical Corporation. Resolution/racemization of aminolactam compounds. 3,941,776, Cl. 260-239.30R.
Signode Corporation: *See—*
Bresler, Burt, 3,942,086.
Sikes, John D.; and Merilan, Charles P., to University of Missouri, The Curators of the. Multistage freezing system for preservation of biological materials. 3,940,943, Cl. 62-64.000.
Sikich, Matthew John. Guidance valve for fish pumps. 3,940,867, Cl. 43-6.500.
Silvestri, Herbert H.; and Johnson, David A., to Bristol-Myers Company. Form II ampicillin. 3,941,773, Cl. 260-239.100.
Silvey, John O.: *See—*
Ward, John E.; Silvey, John O.; and Roberge, James K., 3,940,979.
Simco, Inc.: *See—*
Mason, Stanley I., Jr., 3,940,884.
Simeau, Bernard, to Constructions Electriques R.V. Systems comprising a relaxation oscillator particularly for electrical igniters. 3,942,078, Cl. 317-142.00R.
Simmons, Richard J., to Plastofilm Industries, Inc. Sealed closure system for containers. 3,941,275, Cl. 220-256.000.
Simokat, Frank L.; and Spencer, Lucian W., to Superior Continental Corporation. Relayless switching circuit for application of ringing signals. 3,941,941, Cl. 179-84.00R.
Simpson, David Preston, to Electricity Council, The. Production of ultra-violet radiation. 3,942,018, Cl. 250-493.000.
Simpson, John R.; and Lozier, Robert E., Jr., to El-Trol, Inc. Apparatus and method for displaying the measurement of a tire. 3,941,178, Cl. 157-13.000.
Simpson, William G., to United States of America, National Aeronautics and Space Administration. Mixing insert for foam dispensing apparatus. 3,941,355, Cl. 259-4.0AC.
Simpson, William R., to Sandoz, Inc. 4-(Hydroxy-substituted-amino)-furo[3,2-c]pyridines. 3,941,797, Cl. 260-296.00H.
Singer Company, The: *See—*
Wiese, John M., 3,940,837.
Singewald, Arno; and Fricke, Gunther, to Kali und Salz Aktiengesellschaft. Process for electrostatic separation of pyrite from crude coal. 3,941,685, Cl. 209-9.000.
Sinor, Jerry E.: *See—*
Rodewald, Newell C.; and Sinor, Jerry E., 3,941,124.
Sirocka, Richard L.; and Broxterman, David F., to Fairchild Camera and Instrument Corporation. Electronic watch. 3,942,043, Cl. 307-279.000.
Sivachenko, Eugene: *See—*
Sivachenko, Eugene W.; and Pratt, Howard G., 3,940,965.
Sivachenko, Eugene W.; and Pratt, Howard G., to Sivachenko, Eugene. Method and apparatus for forming corrugating pipe. 3,940,965, Cl. 72-180.000.
Sivo, Andrew Robert, Jr.: *See—*
Burns, John Andrew; and Sivo, Andrew Robert, Jr., 3,941,297.
Six, John W.; and Kramer, Virgil F., to Koehring Company. Crane with removable superstructure. 3,941,252, Cl. 212-69.000.
Skahill, Fred J., to United States of America, Army. Pressure relief valve for providing recoil to blank-firing weapons. 3,941,029, Cl. 89-14.00E.

Skees, Hugh B.: *See—*
DiGirolomo, John S.; Giuffre, Marino; Skees, Hugh B., and Vath, F. Leo, 3,941,308.
SKF Industrial Trading and Development Company, B.V.: *See—*
Schurger, Rainer; Burkl, Erich; and Walter, Lothar, 3,941,434.
Skogen, John D.: *See—*
Koch, Robert B.; and Skogen, John D., 3,941,659.
Skubon, Michael J., to Ashland Oil, Inc. Cast metal appearing metal filled resin compositions. 3,941,743, Cl. 260-38.000.
Skycell Corporation: *See—*
Postlethwaite, William F., 3,940,890.
Slaybaugh, Loren E., to Republic Industries, Inc. Hydraulically controlled pneumatic swinging door operator. 3,940,887, Cl. 49-137.000.
Slobodzian, Gregory E.; Zielinski, Stanley A.; and Payne, Robert A., to Stewart-Warner Corporation. Variable intensity display device. 3,941,926, Cl. 178-7.30D.
Slusarchyk, William A.; Dolfini, Joseph Edward; and Young, Marian G., to E. R. Squibb & Sons, Inc. Method for producing 2-(substituted thio)-3-cephem derivatives. 3,941,779, Cl. 260-243.00C.
Slysh, Paul, to General Dynamics Corporation. Conical structure. 3,940,891, Cl. 52-82.000.
Smalley, Ned J.: *See—*
Owens, Edward W.; and Smalley, Ned J., 3,941,268.
Smith, Clay D.; and Keller, D. V., Jr., to OTISCA Industries Ltd. Separation of hydrocarbonaceous substances from mineral solids. 3,941,679, Cl. 208-11.0LE.
Smith, Jimmy D. Refuse compactor apparatus. 3,941,046, Cl. 100-45.000.
Smith, Raymond Anthony; and Russell, Ralph Thomas, to Albright & Wilson Limited. Novel nitrogen and phosphorus-containing salts. 3,941,896, Cl. 423-306.000.
Smith, William E., to General Electric Company. 1,4-Butanediol from hydrogenated hydroformylated allyl acetate. 3,941,851, Cl. 260-635.00R.
Smolka, Kurt. Device for cleaning shoe soles. 3,940,820, Cl. 15-36.000.
Snarbach, Henry C. Wind powered rotating device. 3,941,504, Cl. 416-197.00A.
Snuggs, Wiley Preston: *See—*
Haraszti, Tegze P.; and Snuggs, Wiley Preston, 3,942,171.
Sobczak, Bernard J., to Teletype Corporation. Snap-action switch. 3,942,145, Cl. 335-188.000.
Soberg, Arnold S. Waterwell pump assembly. 3,941,516, Cl. 417-259.000.
Sobieski, John C.: *See—*
Anderson, Robert M.; and Sobieski, John C., 3,941,555.
Societa Italiana Telecomunicazioni Siemens S.p.A.: *See—*
Vicentini, Arnaldo; Maschi, Francesco; and Arrigoni, Guido, 3,941,935.
Societe Alsacienne de Constructions Mecaniques de Mulhouse: *See—*
Joans, Andre, 3,941,158.
Societe Anonyme de Vehicules Industriels et d'Equipement Mecaniques Saviem: *See—*
Baguelin, Yves, 3,941,113.
Societe Anonyme des Usines Chausson: *See—*
Chartet, Andre, 3,941,293.
Societe Anonyme dite: HEXACHIMIE: *See—*
Gognaco, Jean-Claude, 3,941,833.
Societe Lannionnaise d'Electronique Sle-Citeral: *See—*
Jacob, Jean-Baptiste; Renoulin, Roger; and Le Drezen, Pierre, 3,941,947.
Societe M.T.E.: *See—*
Machefert-Tassin, Yves, 3,941,062.
Societe Nationale d'Etude et de Construction de Moteurs d'Aviation: *See—*
Jumelle, Louis Francois, 3,941,313.
Societe Nouvelle de Roulements: *See—*
Lagnitre, Alain, 3,941,493.
Solartron Electronic Group Limited, The: *See—*
Dorey, Howard Anthony; and Luckhurst, Geoffrey Arthur, 3,942,174.
Tucker, Roger Lewis Raymond, 3,942,172.
Solenberger, John Carl, to Du Pont de Nemours, E. I., and Company. Polyvinyl alcohol-polysaccharide microgels. 3,941,728, Cl. 260-17.00R.
Solenberger, John Carl, to Du Pont de Nemours, E. I., and Company. Polyvinyl alcohol microgel precursor blends. 3,941,730, Cl. 260-17.00R.
Solli, Houk: *See—*
Madsen, Hans Berg; Holst, Preben Lindholm; and Solli, Houk, 3,941,777.
Sollman, Paul B., to G. D. Searle & Co. Resolution of alkyl esters of DL-phenylalanine. 3,941,831, Cl. 260-471.00A.
Sommer, Walter: *See—*
Hennes, Heinrich; and Sommer, Walter, 3,940,968.
Sontrix, Inc.: *See—*
Hackett, Kenneth R., 3,942,178.
Sony Corporation: *See—*
Kawakami, Hirotake; Matsuda, Atsushi; and Takahashi, Kazumasa, 3,941,946.
Kawakami, Hirotake; and Takada, Kantaro, 3,942,029.
Kikuchi, Masafumi; and Takeda, Masashi, 3,942,039.
Nikami, Akira, 3,942,042.
Osakabe, Yoshio, 3,941,931.
Sood, Vijay K.: *See—*
Robb, Raymond R.; and Sood, Vijay K., 3,941,506.
Sopp, Samuel W.: *See—*
Lee, Leonard S.; Sopp, Samuel W.; and Siegel, Howard M., 3,941,621.
Lee, Leonard S.; Uyeda, Yoshio; and Sopp, Samuel W., 3,941,622.
Sorkin, Morris, to TRW Inc. Digital speed control. 3,941,202, Cl. 180-105.00E.
Sourby, John C.; and Wallace, Charles H., to International Telephone and Telegraph Corporation. Hog processing method. 3,940,998, Cl. 73-432.00R.
Southard, William Franklin: *See—*
Huntley, James R.; and Southard, William Franklin, 3,941,020.
Souto Martins, Jose V.: *See—*
Horiuchi, Edward M.; and Souto Martins, Jose V., 3,942,125.
Sozaki, Shigeyuki: *See—*
Masuda, Takashi; Sozaki, Shigeyuki; Ando, Masakatsu; and Oumi, Hideo, 3,941,637.
Spector, George: *See—*
Morse, Samuel F.; and Spector, George, 3,941,083.
Spectradyne, Inc.: *See—*
Cunningham, Paul M., 3,942,117.
Spencer, Lucian W.: *See—*
Simokat, Frank L.; and Spencer, Lucian W., 3,941,941.
Sperry Rand Corporation: *See—*
Baker, Donald H., 3,941,983.
Cantwell, Joseph R., 3,941,446.
Sperry Rand France, S.A.: *See—*
d'Acremont, Alain Marie Charles, 3,940,910.
Spetz, William L.: *See—*
Voss, Robert H.; Ward, Earl M.; and Spetz, William L., 3,941,977.
Spiegel, Raymond William, to Whirlpool Corporation. Dishwasher spray assembly with intermittently operating nozzles. 3,941,139, Cl. 134-176.000.
Spielman, Burton A., to Allied Chemical Corporation. Removable seal for liquid containers. 3,941,270, Cl. 215-261.000.
Spitz, Erich; Huignard, Jean Pierre; and Royer, Odile, to Thomson-CSF. Device for recording a matrix of holographic lenses. 3,941,450, Cl. 350-3.500.
Sprecher & Schuh AG: *See—*
Thaler, Richard, 3,941,962.
Springer, Edward M., to Heyer Inc. Stencil gripping apparatus for a duplicating machine. 3,941,054, Cl. 101-409.000.
Sprout, Elmer E. Updraft exhaust system. 3,941,041, Cl. 98-115.00R.
Stahl, Ulrich; Busse, Oswald; Klesper, Hugo; and Junker, Werner, to Passavant-Werke Michelbacher Huette. Apparatus for continuous dewatering of aqueous suspensions. 3,941,701, Cl. 210-386.000.
Stamicarbon, B.V.: *See—*
Schoen, Lowhardt A. A.; and Busschers, Franciscus A., 3,941,909.
Voskuil, Willem; and van der Donck, Joseph J. M., 3,941,845.
Stammen, Harold A., to Crown Controls Corporation. Fork lift with limit switch controlled retractable guard. 3,941,213, Cl. 187-9.00R.
Standard Oil Company: *See—*
Lee, Richard J., 3,941,834.
Peevey, Robert M., 3,941,189.
Standard Register Company, The: *See—*
DiGirolomo, John S.; Giuffre, Marino; Skees, Hugh B.; and Vath, F. Leo, 3,941,308.
Stange, Klaus K., to Xerox Corporation. Floating gate sheet separator. 3,941,373, Cl. 271-124.000.
Starks, Charles M.: *See—*
Jackson, Robert G.; and Starks, Charles M., 3,941,820.
Stauffer Chemical Company: *See—*
Gentit, William F.; and Marolewski, Theodore A., 3,941,708.
Teach, Eugene G., 3,941,581.
Stauffer, Harry C.: *See—*
Bryson, Millard C.; Murphy, Harry C., Jr.; Murphy, James R.; and Stauffer, Harry C., 3,941,680.
Stauffer, Norman L., to Honeywell Inc. Focus system. 3,941,476, Cl. 356-3.000.
Stauffer, Norman L., to Honeywell Inc. Automatic focus apparatus. 3,941,996, Cl. 250-201.000.
Stedman, Robert N., to Caterpillar Tractor Co. Bulldozer with horizontal brace. 3,941,195, Cl. 172-801.000.
Steel, John F. Solar radiation and glare screen and method of making same. 3,940,896, Cl. 52-307.000.
Steelcase Inc.: *See—*
Scheerhorn, Douglas, 3,941,441.
Stegmaier, Winfried: *See—*
Apenberg, Walter; Bohme, Georg; Fanger, Hans-Ulrich; Glaser, Benno; Hain, Klaus; Hubener, Jorg; Stegmaier, Winfried; Prech, Vaclav; and Vagner, Jaroslav, 3,942,003.
Steinbruchel, Armando B., to Aqua-Chem, Inc. Multi-effect evaporator. 3,941,663, Cl. 202-174.000.
Steinemer, Norbert: *See—*
Kohler, Werner; and Steinemer, Norbert, 3,941,959.
Steinwart, Johannes: *See—*
Maurhoff, Gerhard; and Steinwart, Johannes, 3,940,927.
Stenger, M. Antoine; Cousse, Henri; and Mouzin, M. Gilbert, to Pierre Fabre S.A. Medicaments having psychotropic properties. 3,941,878, Cl. 424-233.000.
Stephen, John F., to Ciba-Geigy Corporation. Containing hindered phenolic norbornane-2,3-dicarboximides stabilized compositions. 3,941,746, Cl. 260-45.80N.

Stephens, Donald E.: *See—*
Ehret, Robert J.; Stephens, Donald E.; Durland, Douglas H.; and Sharples, Thomas D., 3,941,487.
Sterling Drug Inc.: *See—*
Alexander, Ernest John, 3,941,805.
Stern, Melvin, to ASARCO Incorporated. Zinc dust, its preparation, and apparatus for preparing same. 3,941,609, Cl. 106-290.000.
Steunenberg, Robert K.; Martin, Allan E.; and Tomczuk, Zygmunt, to United States of America, Energy Research and Development Administration. Cathode composition for electrochemical cell. 3,941,612, Cl. 136-6.0LF.
Stevens, Donald S., to Assembly Machines, Inc. High accuracy positive positioning mechanism for an assembly machine. 3,940,839, Cl. 29-208.00F.
Stevens, Vincent J. Door lock. 3,940,956, Cl. 70-93.000.
Stevinson, Harry T.; and Baker, Douglas A., to Canadian Patents and Development Limited. Shock actuated electrical pulse generator. 3,942,051, Cl. 310-15.000.
Stewart, Alistair Templeton: *See—*
Love, Ronald Barr; and Stewart, Alistair Templeton, 3,941,561.
Stewart, Donald Fergusson: *See—*
Martin, Anwyn Margaret; Stewart, Donald Fergusson; and Swanson, Andrew Baikie, 3,941,583.
Stewart-Warner Corporation: *See—*
Slobodzian, Gregory E.; Zielinski, Stanley A.; and Payne, Robert A., 3,941,926.
Stickel, Kurt Erwin: *See—*
Lauhoff, Theodor; Quante, Manfred; Stickel, Kurt Erwin; Bolz, Egon; and Semma, Klaus, 3,940,996.
Stigler, Viktor: *See—*
Kuhn, Klaus Roland; and Stigler, Viktor, 3,942,102.
Stigter, Willem Hendrik: *See—*
Grosemans, Jozef-Antoon; vander Lely, Piet; and Stigter, Willem Hendrik, 3,941,392.
Stinson, Leon B., to Hughes Tool Company. Rotary percussion earth boring bit. 3,941,197, Cl. 175-400.000.
Stoakes, Richard Lewis. Structural assemblies. 3,940,897, Cl. 52-395.000.
Stocker, Emil, to Ciba-Geigy AG. One step diazotization coupling process. 3,941,768, Cl. 260-184.000.
Stolk, Douglas A.: *See—*
Norman, Telfer E.; and Stolk, Douglas A., 3,941,589.
Stolle Corporation, The: *See—*
Kaminski, Elton G., 3,941,070.
Stolwyk, Carl F.: *See—*
Moor, Clinton H.; Stolwyk, Carl F.; and Vencill, John J., 3,942,135.
Stoody, Charles A., to Stoody Company. Process for casting faced objects using centrifugal techniques. 3,941,181, Cl. 164-59.000.
Stoody Company: *See—*
Stoody, Charles A., 3,941,181.
Stout, Karl J., to Raytheon Company. Gamma camera display system. 3,942,011, Cl. 250-363.00S.
Strachan, Donald Rittler, to Du Pont de Nemours, E. I., and Company. Composite elastic yarns and process for producing them. 3,940,917, Cl. 57-152.000.
Strasser, Bernd; Kramer, Wolfgang; Mose, Luciano; and Hund, Helmut, to Friedrich Uhde GmbH. Bipolar multiple electrolytic cell comprising a diaphragm and electrode for same. 3,941,675, Cl. 204-256.000.
Stratford Squire International, Magic Mill: *See—*
Howell, LeRoy H., 3,941,010.
Stratton, Michael K.: *See—*
Bailey, John M.; and Stratton, Michael K., 3,941,396.
Street, Louis F. Extrusion device. 3,941,535, Cl. 425-208.000.
Street, Robert W.: *See—*
Herber, John F.; Richard, William R., Jr.; and Street, Robert W., 3,941,709.
Streiber, Ronald W.: *See—*
McLaughlin, Donald L.; and Streiber, Ronald W., 3,941,989.
Strewe, Wolfgang: *See—*
Von Semel, Georg; Schibilla, Eduard; and Strewe, Wolfgang, 3,941,667.
Stripling, William W.; White, Harold V.; and Hunter, Joe S., to United States of America, Army. Radial arm guidance platform tracker. 3,941,345, Cl. 244-3.100.
Strobel, Donald H.: *See—*
Krause, Marvin W.; Strobel, Donald H.; and Seruga, Edward A., 3,940,971.
Strohmeyer, Max: *See—*
Kummer, Rudolf; Nienburg, Hans-Juergen; Hohenschutz, Heinz; Strohmeyer, Max; and Teutsch, Theo, 3,941,848.
Strunk, Toni, to W. Schlafhorst & Co. Braking device in coil support frame or cradle. 3,941,320, Cl. 242-18.0DD.
Studley, Clarence K.: *See—*
Misson, William W.; Studley, Clarence K.; West, William J.; and Liljenwall, Edward T., 3,941,953.
Stumpf, Gunter. Fabric layering machine. 3,941,367, Cl. 270-31.000.
Stumpf, Kenneth D.; and Watson, John T., to Itek Corporation. Rapid response correlation type image motion sensor. 3,942,022, Cl. 250-578.000.
Sturm, Elmar; Cellarius, Hans Joerg; and Vogel, Christian, to Ciba-Geigy Corporation. Regulating the growth of plants and controlling weeds with carbonyl-substituted azabicycloalkanes. 3,941,579, Cl. 71-94.000.
Stut, Hans; and Barowski, Gerhard, to Siemens Aktiengesellschaft. Method for producing highly pure silicon. 3,941,900, Cl. 427-86.000.
Suddeutsche Kalkstickstoff-Werke Aktiengesellschaft: *See—*
Aignesberger, Alois; and Bornmann, Paul, 3,941,734.
Suga, Yozo: *See—*
Takashina, Kikuo; Kitayama, Minoru; Nakamura, Motoharu; Suga, Yozo; and Tanaka, Kiyoshi, 3,941,623.
Sugano, Akira: *See—*
Yosioka, Takayuki; Komada, Tadashi; Sugano, Akira; and Fukumaru, Takafumi, 3,942,088.
Sumi, Momoki; Kanda, Goro; Iriguchi, Norio; Isohata, Susumu; and Sasaki, Kyoichi, to Asahi Kasei Kogyo Kabushiki Kaisha. Microwave cooking apparatus. 3,941,967, Cl. 219-10.55E.
Sumitomo Electric Industries, Ltd.: *See—*
Uehara, Kenichiro; Ito, Atsuo; Nishimune, Koichi; and Fujita, Kazutoshi, 3,942,017.
Sumitomo Metal Industries, Ltd.: *See—*
Uchiyama, Hisashi; Meno, Naohiko; Senjo, Teizo; and Kobayashi, Makio, 3,941,572.
Sumitomo Naugatuck Co., Ltd.: *See—*
Tajima, Shigeru; Shimamura, Takeshi; Matsumoto, Kojiro; Sekiguchi, Sadao; Yamagoshi, Tanoshi; and Fjieda, Kazumasa, 3,941,912.
Sun Electric Corporation: *See—*
Voross, Zoltan; Caruth, James R.; and Leung, Yam C., 3,940,977.
Sun Oil Company of Pennsylvania: *See—*
Lerner, Julius, 3,941,148.
Sundstrand Corporation: *See—*
Louis, Joseph E.; and Cannell, Roger D., 3,941,514.
Sundt, Eilert, to Olaf Fjeldsend A/S. Apparatus for magnetic treatment of a flowing liquid. 3,941,700, Cl. 210-223.000.
Superior Continental Corporation: *See—*
Simokat, Frank L.; and Spencer, Lucian W., 3,941,941.
Superior Iron Works & Supply Company, Inc.: *See—*
Green, Lane A., 3,941,324.
Surmatis, Joseph Donald; and Walser, Armin, to Hoffmann-La Roche Inc. Method for synthesizing rhodoxanthin. 3,941,841, Cl. 260-586.00R.
Sutton, Jerry L.: *See—*
Booth, Newell O.; Saltzer, Benjamin A.; Thorn, James V.; and Sutton, Jerry L., 3,942,150.
Suwa, Takeshi: *See—*
Machi, Sueo; Suwa, Takeshi; Takehisa, Masaaki; and Seguchi, Tadao, 3,941,671.
Suzuki, Hideo: *See—*
Kato, Katsuhiro; Suzuki, Hideo; Yano, Norio; Kishimoto, Yojiro; and Ishiguro, Ginya, 3,942,142.
Suzuki, Kohji: *See—*
Nagahara, Yasumori; and Suzuki, Kohji, 3,941,472.
Svenska Cellulosa Aktiebolaget: *See—*
Wennerblom, Bengt Axel; and Svensson, Gustav Robert, 3,941,902.
Svensson, Gustav Robert: *See—*
Wennerblom, Bengt Axel; and Svensson, Gustav Robert, 3,941,902.
Swanson, Andrew Baikie: *See—*
Martin, Anwyn Margaret; Stewart, Donald Fergusson; and Swanson, Andrew Baikie, 3,941,583.
Swedenberg, Clyde J.; Fain, Charles C.; and Rutledge, William W. Method and composition for applying a covering to a wall or like substrate. 3,941,632, Cl. 156-71.000.
Sweger, Theodore J., to Illinois Railway Equipment Company. Wire form locking means for detachable air hose couplings of railway cars. 3,941,254, Cl. 213-76.000.
Swiatowiec, Frank J.; and Rao, Ramachandra A., to Motorola, Inc. Current mode logic circuit. 3,942,033, Cl. 307-215.000.
Swift and Company Limited: *See—*
Newman, Jack R., 3,941,739.
Swiss Aluminium Ltd.: *See—*
Kugler, Tibor; and Rieger, Hans Wolfhart, 3,941,899.
Sylvester, Gordon C.: *See—*
Travaglio, Dalny; Dravnieks, Konstantins; and Sylvester, Gordon C., 3,941,310.
Symes, William F.: *See—*
Nelson, George D.; Nissing, Kenneth J.; and Symes, William F., 3,941,784.
Syncro Corporation: *See—*
Carmichael, Thomas F.; and Maier, Richard J., 3,941,111.
Szilagyi, Gyula: *See—*
Grega, Erzsebet; Gribovszky, Pal; Marosvolgyi, Sandor; Pinter, Zoltan; Szilagyi, Gyula; Szita, Istvan; Tarr, Csaba; and Tasi, Laszlo, 3,941,783.
Szita, Istvan: *See—*
Grega, Erzsebet; Gribovszky, Pal; Marosvolgyi, Sandor; Pinter, Zoltan; Szilagyi, Gyula; Szita, Istvan; Tarr, Csaba; and Tasi, Laszlo, 3,941,783.
Szymanski, Hans Joachim; and Dockner, Toni, to BASF Aktiengesellschaft. Continuous manufacture of N-alkylated arylamines. 3,941,844, Cl. 260-577.000.
T.A.D. Avanti, Inc.: *See—*
Bonsky, Elmer C., 3,941,934.
T. A. Pelsue Company: *See—*
Beavers, Allan E., 3,941,140.

T. D. Williamson, Inc.: *See—*
Ver Nooy, Burton; Payne, Larry D.; and Kendall, Robert L., 3,940,855.
Taatjes, Steven W.: *See—*
Leckband, Lee M.; and Taatjes, Steven W., 3,940,906.
Tack, Carl E., Jr., to Danly Machine Corporation. Method and apparatus for numerical control. 3,941,987, Cl. 235-151.110.
Tadakuma, Susumu; Inagaki, Junpei; and Tanaka, Shigeru, to Agency of Industrial Science Technology. Control apparatus of DC motors. 3,942,085, Cl. 318-341.000.
Tajima, Shigeru; Shimamura, Takeshi; Matsumoto, Kojiro; Sekiguchi, Sadao; Yamagoshi, Tanoshi; and Fjieda, Kazumasa, to Sumitomo Naugatuck Co., Ltd. Copolymer latex and paper coating composition thereof. 3,941,912, Cl. 428-537.000.
Tajimi, Hiroshi: *See—*
Yamamoto, Shizuo; Nagai, Yuichi; Shimizu, Nobuyuki; and Tajimi, Hiroshi, 3,940,895.
Takada, Kantaro: *See—*
Kawakami, Hirotake; and Takada, Kantaro, 3,942,029.
Takahashi, Kazumasa: *See—*
Kawakami, Hirotake; Matsuda, Atsushi; and Takahashi, Kazumasa, 3,941,946.
Takahashi, Tadashi; and Onishi, Kazuo, to Hitachi, Ltd. Brushless motor. 3,942,083, Cl. 318-138.000.
Takamuku, Shoji: *See—*
Okauchi, Tetsuo; Takamuku, Shoji; Tamura, Saburo; and Chou, Seifun, 3,941,879.
Takao, Hiroshi; Togawa, Kinmochi; Matoba, Kazuo; and Hata, Yoshitaka, to Nissan Motor Co., Ltd. Oxygen sensor devoid of catalytic oxidation activity. 3,941,673, Cl. 204-195.00S.
Takashina, Kikuo; Kitayama, Minoru; Nakamura, Motoharu; Suga, Yozo; and Tanaka, Kiyoshi, to Nippon Steel Corporation. Method for producing a grain-oriented electrical steel sheet using separators comprising metal nitrides. 3,941,623, Cl. 148-113.000.
Takatori Machinery Works, Ltd.: *See—*
Fukuyama, Yoshinobu, 3,941,069.
Takeda Chemical Industries, Ltd.: *See—*
Hashimoto, Naoto; Kuritani, Masaaki; and Toukai, Noriaki, 3,941,823.
Okauchi, Tetsuo; Takamuku, Shoji; Tamura, Saburo; and Chou, Seifun, 3,941,879.
Takeda, Masashi: *See—*
Kikuchi, Masafumi; and Takeda, Masashi, 3,942,039.
Takehisa, Masaaki: *See—*
Machi, Sueo; Suwa, Takeshi; Takehisa, Masaaki; and Seguchi, Tadao, 3,941,671.
Takeuchi, Yasuhisa, to Nissan Motor Co., Ltd. Device for preventing drunken driving of vehicle. 3,942,151, Cl. 340-53.000.
Takeuti, Yasuhito: *See—*
Kano, Motomi; Shioyama, Hitoshi; Takeuti, Yasuhito; and Niikawa, Masahiro, 3,941,974.
Takigawa, Toru: *See—*
Tanaka, Yasuo; Yamamoto, Hideaki; Ooki, Keiko; Goto, Naohiro; and Takigawa, Toru, 3,941,672.
Takiguchi, Koichi, to Rank Xerox Ltd. Contact-heating fixing device for electrophotography. 3,941,558, Cl. 432-60.000.
Talcoma Teoranta: *See—*
O'Connor, Bartholomew John, 3,942,001.
Tamarack Scientific Co., Inc.: *See—*
Sheets, Ronald E., 3,941,475.
Tamura, Saburo: *See—*
Okauchi, Tetsuq; Takamuku, Shoji; Tamura, Saburo; and Chou, Seifun, 3,941,879.
Tanabe, Kenzo; and Mino, Mineo, to Matsushita Electric Industrial Co., Ltd. Magnetic tape reproducing system. 3,942,188, Cl. 360-10.000.
Tanaka, Kiyoshi: *See—*
Takashina, Kikuo; Kitayama, Minoru; Nakamura, Motoharu; Suga, Yozo; and Tanaka, Kiyoshi, 3,941,623.
Tanaka, Shigeru: *See—*
Tadakuma, Susumu; Inagaki, Junpei; and Tanaka, Shigeru, 3,942,085.
Tanaka, Takehiko: *See—*
Koike, Hiroshi; Fukui, Akio; Ito, Yuji; Tanaka, Takehiko; and Okuda, Yukio, 3,941,815.
Tanaka, Yasuo; Yamamoto, Hideaki; Ooki, Keiko; Goto, Naohiro; and Takigawa, Toru, to Hitachi, Ltd.; and Nippon Hoso Kyokai. Method of manufacturing light sensitive heterodiode. 3,941,672, Cl. 204-192.000.
Tanifuji, Shinya; Morooka, Yasuo; and Tanuma, Masaya, to Hitachi, Ltd. Interstand tension control method and apparatus for tandem rolling mills. 3,940,960, Cl. 72-19.000.
Tanuma, Masaya: *See—*
Tanifuji, Shinya; Morooka, Yasuo; and Tanuma, Masaya, 3,940,960.
Tarasuk, Walter Renald; and Yonemitsu, Isao David, to Canadian General Electric Company Limited. Tubular fuel cluster. 3,941,654, Cl. 176-61.000.
Tarczy-Hornoch, Zoltan. Pulse synchronizing apparatus and method. 3,942,124, Cl. 328-63.000.
Tarr, Csaba: *See—*
Grega, Erzsebet; Gribovszky, Pal; Marosvolgyi, Sandor; Pinter, Zoltan; Szilagyi, Gyula; Szita, Istvan; Tarr, Csaba; and Tasi, Laszlo, 3,941,783.
Tarrant, James H.: *See—*
Wells, Daniel M.; and Tarrant, James H., 3,941,042.
Tasi, Laszlo: *See—*
Grega, Erzsebet; Gribovszky, Pal; Marosvolgyi, Sandor; Pinter, Zoltan; Szilagyi, Gyula; Szita, Istvan; Tarr, Csaba; and Tasi, Laszlo, 3,941,783.
Tasker, Homer G.; and Green, William F., to Whittaker Corporation. Oil well pressure sensing system. 3,940,980, Cl. 73-152.000.
Tattam, Francis Edward. Box or case. 3,941,274, Cl. 220-62.000.
Tavelle, Charles L.; and Wittschen, Robert F., to Raybestos-Manhattan Inc. Method of sealing the end of a sleeved roll. 3,941,635, Cl. 156-86.000.
Taylor, Allen L., to Minnesota Mining and Manufacturing Company. Electrically compensated sensor. 3,940,974, Cl. 73-88.50R.
Taylor, Allen L., to Minnesota Mining and Manufacturing Company. Directional radiation detector. 3,942,009, Cl. 250-338.000.
Taylor, Donald: *See—*
Barrow, John Samuel; Radcliffe, Allen; and Taylor, Donald, 3,941,917.
Taylor, James Howard: *See—*
Moss, Gerald; and Taylor, James Howard, 3,941,314.
Taylor, Lynn J.; and Tobias, John W., to Owens-Illinois, Inc. Degradable plastics containing dual-function additive system. 3,941,759, Cl. 260-92.80A.
Taylor-Winfield Corporation, The: *See—*
Toma, Charles A., 3,941,972.
Teach, Eugene G., to Stauffer Chemical Company. Meta-bis anilide derivatives and their utility as herbicides. 3,941,581, Cl. 71-118.000.
Teckton, Inc.: *See—*
Goltsos, Costas E., 3,941,044.
TED Bildplatten Aktiengesellschaft, AEG-Telefunken, TELDEC: *See—*
Borner, Manfred; Glasmachers, Gisbert; Bernecker, Otto; Riemann, Volker; and Maslowski, Stefan, 3,941,945.
Tefft, Edward G.: *See—*
Kennedy, Richard W.; and Tefft, Edward G., 3,941,625.
Telefonaktiebolaget L M Ericsson: *See—*
Pettersson, Georg Gustaf Lennart, 3,942,152.
Teletype Corporation: *See—*
Bellino, Joseph A.; and von Braun, Leo, 3,941,230.
Sobczak, Bernard J., 3,942,145.
Wanat, Robert R., 3,941,288.
Telex/Computer Products, Inc.: *See—*
McCollum, Robert F.; Jones, Robert J.; and Deck, Philip E., 3,941,327.
Teng, Robert N.: *See—*
Covey, William B.; Mastandrea, John R.; and Teng, Robert N., 3,940,981.
Terral, Leonard G.; Regelson, Ephraim; Sake, William E.; Matusiak, Ronald J.; and Rea, William L., to United States of America, Navy. Eyeletting attachment for drill presses. 3,940,970, Cl. 72-416.000.
Terzian, Rouben T.: *See—*
Kaelin, Bette M.; and Terzian, Rouben T., 3,940,880.
Tetra Pak International AB: *See—*
Balla, Gyula, 3,941,643.
Teutsch, Theo: *See—*
Kummer, Rudolf; Nienburg, Hans-Juergen; Hohenschutz, Heinz; Strohmeyer, Max; and Teutsch, Theo, 3,941,848.
Texaco Inc.: *See—*
Carlin, Joseph T.; and Cardenas, Ricardo L., 3,941,192.
Graham, William J., 3,941,351.
Larkin, John M., 3,941,846.
Texas Instruments Incorporated: *See—*
Bell, David B.; and Cipher, John A., 3,942,121.
Buss, Dennis D., 3,942,034.
Buss, Dennis Darcy, 3,942,035.
Chappell, Peter; Hicks, Burnette W.; and Gilbert, Gerald M., 3,941,984.
Cragon, Harvey George, 3,941,979.
Ham, Ronald E., 3,942,120.
Haraszti, Tegze P.; and Snuggs, Wiley Preston, 3,942,171.
Jost, Ernest M.; Reenstra, Arthur L.; and Trenkler, George, 3,940,992.
Westfall, Wilmer J., Jr., 3,942,149.
Thaler, Richard, to Sprecher & Schuh AG. Gas blast circuit breaker. 3,941,962, Cl. 200-148.00A.
Theissen, Robert J., to Mobil Oil Corporation. Substituted phenoxybenzoic acids and esters thereof. 3,941,830, Cl. 260-471.00R.
Thermo Electron Corporation: *See—*
Davis, Jerry P., 3,940,939.
Thiele, Hans Dietrich, to PMD Entwicklungswerk fur Kunststoff-Maschinen GmbH & Co. KG. Blow molding device having a blow mandrel with a seal forming ring. 3,941,541, Cl. 425-292.000.
Thiery, Jean: *See—*
Chatard, Michel; Grolet, Pierre; Reynard, Remi; and Thiery, Jean, 3,941,146.
Thijs, Victor Jan: *See—*
Timmerman, Daniel Maurice; Thijs, Victor Jan; De Winter, Walter Frans; Claes, Frans Henri; and Vandenabeele, Hubert, 3,941,727.
Thill, Timothy N., to Winnebago Industries, Inc. Sectional door and guard rail assembly. 3,941,180, Cl. 160-229.00R.
Thiokol Corporation: *See—*
Dolling, William T.; and Kapp, Jack R., 3,941,433.
Thomas, Howard M.; and Borowiec, Richard A., to Wurlitzer Company, The. Chord button assembly. 3,941,023, Cl. 84-1.010.

Thompson, Ivan M.: *See—*
Maskal, John; Thompson, Ivan M.; and Heikel, Henrik R., 3,941,610.

Thomson-CSF: *See—*
Berrod, Francois; and Puverel, Fernand, 3,942,181.
Rannou, Jean; and Luther, William, 3,942,180.
Spitz, Erich; Huignard, Jean Pierre; and Royer, Odile, 3,941,450.

Thorn, James V.: *See—*
Booth, Newell O.; Saltzer, Benjamin A.; Thorn, James V.; and Sutton, Jerry L., 3,942,150.

Thorne, William Duncan: *See—*
Matuck, George Coleman; Sienkiewicz, Gerald Carl; and Thorne, William Duncan, 3,941,231.

Thorp, Arthur G., II, deceased (by Thorp, Ruth S., administratrix), to Westinghouse Electric Corporation. Control rod drive shaft latch. 3,941,653, Cl. 176-36.00R.

Thorp, Ruth S., administratrix: *See—*
Thorp, Arthur G., II, deceased, 3,941,653.

Tibbs, Robert C. Sequential trigger release for injection device. 3,941,130, Cl. 128-218.00A.

Tilman, Ted N. High current high voltage switch structure with conductive piston. 3,941,957, Cl. 200-82.00R.

Timmerman, Daniel Maurice; Thija, Victor Jan; De Winter, Walter Frans; Claes, Frans Henri; and Vandenabeele, Hubert, to AGFA-GEVAERT N.V. Hydrophilic aqueous coating composition containing aqueous binder solution and select homogeneous aqueous dispersion of polymer particles. 3,941,727, Cl. 260-8.000.

Tobias, John W.: *See—*
Taylor, Lynn J.; and Tobias, John W., 3,941,759.

Toda, Toshimasa: *See—*
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Toda, Toshimasa; Mori, Eiko; Horiuchi, Hideo; Higashida, Susumu; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohata, Noriyuki; and Ohsawa, Hisayou, 3,941,744.

Todoroki, Tsunehiko; and Shida, Sankichi, to Matsushita Electric Industrial Co., Ltd. Method for making a clad wire for an electric contact. 3,940,964, Cl. 72-177.000.

Togawa, Kinmochi: *See—*
Takao, Hiroshi; Togawa, Kinmochi; Matoba, Kazuo; and Hata, Yoshitaka, 3,941,673.

Togneri, Mauro Guiseppe; and Elliott, Harry Samuel. AC-to-DC converter system. 3,942,095, Cl. 321-47.000.

Tokyo Shibaura Electric Co., Ltd.: *See—*
Minami, Masana, 3,942,159.

Toll, Wolcott. Insulation assembly for a tubular conduit pipe. 3,941,159, Cl. 138-147.000.

Toma, Charles A., to Taylor-Winfield Corporation, The. Shear in gap flash welder. 3,941,972, Cl. 219-97.000.

Tomcufcik, Andrew Stephen, to American Cyanamid Company. Substituted aminobenzylideneamino guanidine compounds. 3,941,825, Cl. 260-465.00E.

Tomczuk, Zygmunt: *See—*
Steunenberg, Robert K.; Martin, Allan E.; and Tomczuk, Zygmunt, 3,941,612.

Tomikawa, Masami; Ishitobi, Hiroyuki; and Ohkawa, Hideo, to Idemitsu, Kosan Kabushiki-Kaisha (Idemitsu Kosan Co., Ltd.). Lightweight construction materials and articles made thereof. 3,940,811, Cl. 5-361.00R.

Tomura, Teruichi; Akatsuka, Mitsuo; and Iyama, Hiroyuki, to Hitachi, Ltd. Electric discharge lamp lighting device. 3,942,070, Cl. 315-101.000.

Torii, Tatsumi, to Aisin Seiki Kabushiki Kaisha. Brake apparatus and plural and independent actuators therefor. 3,941,218, Cl. 188-106.00F.

Toukai, Noriaki: *See—*
Hashimoto, Naoto; Kuritani, Masaaki; and Toukai, Noriaki, 3,941,823.

Townsend, Henry M.: *See—*
Gillilan, James E.; and Townsend, Henry M., 3,941,509.

Toyo Kogyo Co., Ltd.: *See—*
Sasame, Takao; and Yagi, Toshio, 3,941,569.

Toyota Jidosha Hanbai Kabushiki Kaisha: *See—*
Kurii, Masaaki; Kobari, Kiyoshi; and Yanagi, Osamu, 3,941,204.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Kobayashi, Nobuyuki; and Nakada, Masahiko, 3,941,106.

Tran-Quang, Dang, to Compagnie Generale de Radiologie. High power X-ray tube. 3,942,059, Cl. 313-60.000.

Traube, John Harry; and Sherer, R. Bruce, to Whirlpool Corporation. Water inlet device for controlling flow to an appliance. 3,941,153, Cl. 137-562.000.

Travaglio, Dalny; Dravnieks, Konstantins; and Sylvester, Gordon C., to Wehr Corporation. Thermostatic control for use in variable air distribution systems. 3,941,310, Cl. 236-49.000.

Trbovich, Nicholas D. Board game amusement device. 3,941,381, Cl. 273-85.00R.

Trebron Holdings Limited: *See—*
Hamy, Norbert, 3,941,239.

Trenkler, George: *See—*
Jost, Ernest M.; Reenstra, Arthur L.; and Trenkler, George, 3,940,992.

Triebskorn, Bruno: *See—*
Broecker, Franz Josef; Zirker, Guenter; Triebskorn, Bruno; Marosi, Laszlo; Schwarzmann, Matthias; Dethlefsen, Winfried; and Kaempfer, Knut, 3,941,721.

Troger, Karl-Jurgen: *See—*
Vollheim, Gerhard; Troger, Karl-Jurgen; and Lippert, Gerhard, 3,941,717.

Troope, Walter S.; and Lawrence, Jackson, to Cluett, Peabody & Co., Inc. Method for compressively shrinking textile fabrics at high speed. 3,940,833, Cl. 26-18.600.

Troseth, Ralph. Unitary space transit. 3,940,859, Cl. 33-270.000.

Troth, John S., to Pamark, Inc. Folded plastic container with snap lid. 3,941,300, Cl. 229-5.500.

Trushin, Jury Petrovich: *See—*
Andreev, Sergei Vasilievich; Leibenzon, Mikhail Grigorievich; Trushin, Jury Petrovich; and Luzgin, Mikhail Sergeevich, 3,941,089.

TRW Inc.: *See—*
Mueller, Milton W., 3,941,035.
Nasvytis, Pius J.; and Mueller, Milton W., 3,941,505.
Sorkin, Morris, 3,941,202.

Trythall Design and Development Ltd.: *See—*
Trythall, William John Courtney, 3,941,426.

Trythall, William John Courtney, to Trythall Design and Development Ltd. Apparatus for handling flowable material. 3,941,426, Cl. 302-26.000.

Tshida, Naoyashi; Watanabe, Atsushi; and Ishii, Yukio, to Mitsui Shipbuilding and Engineering Co., Ltd.; and Japan Ship's Machinery Development Association. Engine cover supporting apparatus of internal combustion engines. 3,941,115, Cl. 123-198.00E.

Tsubaki, Tohru: *See—*
Sasaki, Kouji; Nakano, Seizo; and Tsubaki, Tohru, 3,941,963.

Tsuboi, Yozi: *See—*
Oe, Noboru; and Tsuboi, Yozi, 3,941,048.

Tsuchiya, Hiroyoshi; Yoshida, Kunio; Tsuda, Yukifumi; Hayami, Heijiro; and Kotera, Hiroaki, to Matsushita Electric Industrial Co., Ltd. Facsimile system of run-length. 3,941,922, Cl. 178-6.000.

Tsuda, Yukifumi: *See—*
Tsuchiya, Hiroyoshi; Yoshida, Kunio; Tsuda, Yukifumi; Hayami, Heijiro; and Kotera, Hiroaki, 3,941,922.

Tsukamoto, Akira: *See—*
Hoh, George Lok Kwong; and Tsukamoto, Akira, 3,941,904.

Tsuruda, Tadao: *See—*
Moriyama, Hiromi; Kuwabara, Motosuke; Jin, Katsuyuki; and Tsuruda, Tadao, 3,941,952.

Tsuruta, Hidemasa; Hiwatashi, Yukinori; Hirabayashi, Teruhiko; and Kumata, Seiji, to Nittetu Chemical Engineering Ltd. Process for treating gas containing hydrogen sulfide. 3,941,875, Cl. 423-571.000.

Tucker, Gerald L.; and Blanton, Elmer Ladelle, to Mississippi Chemical Corporation. Zinc oxide coated urea. 3,941,578, Cl. 71-28.000.

Tucker, Joseph M., Jr. Powered tool bench. 3,941,002, Cl. 74-16.000.

Tucker, Robert C., Jr., to Union Carbide Corporation. Wesr-resistant bearing material and a process for making it. 3,941,903, Cl. 427-190.000.

Tucker, Roger Lewis Raymond, to Solartron Electronic Group Limited, The. Bipolar mark-space analogue-to-digital converter. 3,942,172, Cl. 340-347.0NT.

Tundermann, John Hayes; and Harrington, John Herbert, to International Nickel Company, Inc., The. Production of reflective metal flake pigments. 3,941,584, Cl. 75-.5OR.

Tuomaala, Jorma Aarne Kullervo, to A. Ahlstrom Osakeyhtio. Roller. 3,941,435, Cl. 308-20.000.

Tupitsyn, Konstantin Konstantinovich: *See—*
Kostylev, Alexandr Dmitrievich; Gurkov, Konstantin Stepanovich; Tupitsyn, Konstantin Konstantinovich; and Kreimer, Vladimir Isaakovich, 3,941,101.

Turner, John F.: *See—*
Collins, Don E.; and Turner, John F., 3,942,175.

Twyford Moors (Aircraft & Engineering Limited): *See—*
Doe, Ewart H.; and Linforth, William J., 3,941,256.

Tyler, Arthur W., to Computervision Corporation, The. Wire bonder. 3,941,486, Cl. 356-172.000.

Tyrseck, Walter J., to Robertson Paper Box Co., Inc. Auto partition pack with handles. 3,941,302, Cl. 229-27.000.

Tyson, Jack J.: *See—*
Pei, Yu K.; and Tyson, Jack J., 3,941,117.

Uchida Sharyo Co., Ltd.: *See—*
Uchida, Suekichi, 3,941,416.

Uchida, Suekichi, to Uchida Sharyo Co., Ltd. Folding chair. 3,941,416, Cl. 297-45.000.

Uchiyama, Hisashi; Meno, Naohiko; Senjo, Teizo; and Kobayashi, Makio, to Sumitomo Metal Industries, Ltd.; and Fuji Kasui Engineering Co., Ltd. Process for gas-absorption and dust-removal. 3,941,572, Cl. 55-90.000.

Uchiyama, Tadamitsu: *See—*
Ohno, Genji; Uchiyama, Tadamitsu; Ohki, Seisaku; and Morohashi, Hishao, 3,941,312.

Uehara, Kenichiro; Ito, Atsuo; Nishimune, Koichi; and Fujita, Kazutoshi, to Sumitomo Electric Industries, Ltd. Apparatus for irradiation with electron beam. 3,942,017, Cl. 250-492.00B.

Ugi, Ivar: *See—*
Hermann, Gunther; Hoffmann, Peter; Rosendahl, Friedrich-Karl; and Ugi, Ivar, 3,941,887.

Uhlig, Albert R., to Owens-Illinois, Inc. Apparatus for blow molding plastic articles. 3,941,542, Cl. 425-326.00B.

Uitti, Paul M.: *See—*
MacInnes, Hugh; and Uitti, Paul M., 3,941,437.

Ulrich, Charles J., to American Safety Equipment Corporation. Safety belt retractor. 3,941,330, Cl. 242-107.40R.

Ultrasonic Systems, Inc.: *See—*
Balamuth, Lewis; Rutten, Michael R.; and Meyer, Robert, 3,941,424.
Umeya, Eiji; and Yanagisawa, Hifumi, to Kabushiki Kaisha Meidensha. Vacuum power circuit breaker. 3,941,960, Cl. 200-144.00B.
Union Carbide Corporation: *See—*
Klingebiel, Ward J., 3,941,529.
Miller, Walter A.; Shaw, Richard G.; and King, Paul A., 3,941,865.
Tucker, Robert C., Jr., 3,941,903.
Uniroyal Inc.: *See—*
McCabe, James L.; and Loeble, William D., 3,941,162.
United Artists Music and Records Group, Inc.: *See—*
Hunyar, Csaba K.; and Green, Jesse, 3,941,547.
United States Envelope Company: *See—*
Gendron, Wilfred H., 3,941,309.
United States Gypsum Company: *See—*
Balinski, Henry A., 3,940,899.
United States of America
Agriculture: *See—*
Abbott, Thomas P., 3,941,767.
Hensarling, Thomas P.; Jacks, Thomas J.; and Yatsu, Lawrence Y., 3,941,764.
Air Force: *See—*
Collins, Don E.; and Turner, John F., 3,942,175.
Laker, Kenneth R.; Budreau, Alan J.; and Carr, Paul H., 3,942,140.
Park, Yoon Soo; and Shin, Bok Kyoon, 3,940,847.
Schaedla, William Hugh, 3,942,138.
Viets, Hermann, 3,941,335.
Army: *See—*
Acord, Timothy T., 3,941,522.
Cobb, Donald R., 3,941,059.
Eve, Clifford F.; and Garbuny, Max, 3,942,008.
Gilbert, Everett E., 3,941,812.
Moyers, Thomas E., Jr., 3,941,999.
Phillips, John F.; Murfree, James A., Jr.; Wharton, Walter W.; and Duncan, William A., 3,941,626.
Skahill, Fred J., 3,941,029.
Stripling, William W.; White, Harold V.; and Hunter, Joe S., 3,941,345.
Zinn, Mortimer H., 3,942,132.
Energy Research and Development Administration: *See—*
Johnson, Melvin L.; and Shawver, Bruce M., 3,941,413.
McDowell, William P.; and Bobis, James P., 3,942,014.
McKee, John M., Jr., 3,941,586.
Roche, Michael F., 3,941,566.
Steunenberg, Robert K.; Martin, Allan E.; and Tomczuk, Zygmunt, 3,941,612.
Environmental Protection Agency: *See—*
Moss, Gerald; and Taylor, James Howard, 3,941,314.
Health, Education and Welfare: *See—*
Mason, William H., 3,941,356.
National Aeronautics and Space Administration: *See—*
Simpson, William G., 3,941,355.
Navy: *See—*
Bayles, John J.; and Roster, Theodore J., 3,940,814.
Booth, Newell O.; Saltzer, Benjamin A.; Thorn, James V.; and Sutton, Jerry L., 3,942,150.
Dorn, Clifford G., 3,942,179.
Fluhr, Frederick R.; Hanley, Stephen T.; and Brown, R. Bernard, 3,942,127.
Hironaka, Melvin C., 3,940,982.
Paige, Marshall A., 3,941,354.
Peterson, Eugene W.; Wurtz, Howard P., Jr.; and Winner, Marvin R., 3,942,010.
Schneider, Irwin, 3,941,482.
Shipp, Kathryn G.; and Kaplan, Lloyd A., 3,941,853.
Terral, Leonard G.; Regelson, Ephraim; Sake, William E.; Matusiak, Ronald J.; and Rea, William L., 3,940,970.
U.S. Philips Corporation: *See—*
Armstrong, Desmond Ross, 3,942,044.
Claridge, Geoffrey Maximilian Lawrence; Driver, Brian Sydney; and Jarvis, Timothy Robert, 3,942,019.
deLeeuw, Franciscus Hermanus, 3,942,165.
D'Hoogh, Guido Odilon Maurits, 3,941,932.
Gelsing, Richardus Johannes Henricus; and van Steensel, Kees, 3,942,187.
Grosemans, Jozef-Antoon; vander Lely, Piet; and Stigter, Willem Hendrik, 3,941,392.
Kruger, Uwe, 3,941,453.
Lebailly, Jacques, 3,942,185.
Schilz, Wolfram; Rahlff, Manfred; Schmidt, Uwe Jurgen; Plass, Klaus Gottfried; and Schroder, Eckhard, 3,941,456.
van Esdonk, Johannes; and Hornman, Johannes Petrus, 3,942,061.
Vredenbregt, Jakob; Klomp, Antonius Maria; and Hurkmans, Adrianus Cornelis Maria, 3,941,137.
Winter, Frederik Nicolaas; and Van Gils, Wilhelmus Martinus Jozef, 3,942,063.
United States Steel Corporation: *See—*
Hind, Robert Duncan, 3,941,281.
Pringle, William L., 3,941,221.
Pringle, William L., 3,941,411.
United Technologies Corporation: *See—*
Danzer, Paul M.; and Rae, Giles E., 3,942,177.
United Turbine AB & Co., Kommanditbolag: *See—*
Kronogard, Sven-Olof, 3,941,499.
University of Cincinnati, The: *See—*
Olinger, Charles P.; Ohlhaber, Ronald L.; and Kot, Casey, 3,941,121.
University of Illinois Foundation, The: *See—*
Merkelo, Henry, 3,941,998.
Metcalf, Robert L.; Kapoor, Inder; and Hirwe, Asha, 3,941,842.
University of Missouri, The Curators of the: *See—*
Noteboom, William D., 3,941,661.
Sikes, John D.; and Merilan, Charles P., 3,940,943.
Unterleitner, Fred C.: *See—*
Kapany, Narinder S.; and Unterleitner, Fred C., 3,941,467.
Unterreiner, Josef, to Pretema A.G. Method and apparatus for drying a hygroscopic material possessing fibrous structure. 3,940,860, Cl. 34-46.000.
Upjohn Company, The: *See—*
Gall, Martin, 3,941,802.
Gall, Martin, 3,941,803.
Urban, Friedrich: *See—*
Herbeck, Rudolf; Kolk, Erich; Schweier, Guenther; Schick, Hans; and Urban, Friedrich, 3,941,760.
Us, Vasily Ivanovich: *See—*
Bondarenko, Oleg Petrovich; Medovar, Boris Izrailevich; Podola, Nikolai Vasilievich; Kravchuk, Anatoly Iosifovich; Marchenko, Alexandr Mikhailovich; Baglai, Vitaly Mikhailovich; Vernik, Alexandr Borisovich; Kamensky, Leonid Alexeevich; Us, Vasily Ivanovich; Mokhnach, Vladislav Konstantinovich; and Andrianov, Georgy Grigorievich, 3,942,105.
Uyeda, Yoshio: *See—*
Lee, Leonard S.; Uyeda, Yoshio; and Sopp, Samuel W., 3,941,622.
Uzumecki, Richard W.: *See—*
Dimmick, George D.; Rhodes, Kevin J.; and Uzumecki, Richard W., 3,942,064.
Vacher, Jacques: *See—*
Odru, Rene; and Vacher, Jacques, 3,941,997.
Vagner, Jaroslav: *See—*
Apenberg, Walter; Bohme, Georg; Fanger, Hans-Ulrich; Glaser, Benno; Hain, Klaus; Hubener, Jorg; Stegmaier, Winfried; Prech, Vaclav; and Vagner, Jaroslav, 3,942,003.
Valia, Maheshkumar Parmanandas; and Vesperman, William Charles, to Western Electric Company, Inc. Strand material covered with clear flame retardant composition and methods of making. 3,941,908, Cl. 428-379.000.
Valmet Oy: *See—*
Koski, Erkki, 3,941,651.
Van Dorn Company: *See—*
McKinney, Lynn B.; and Ortiz, Gary R., 3,941,277.
van Basshuysen, Richard: *See—*
Seufer, Theo; and van Basshuysen, Richard, 3,941,097.
Vandenabeele, Hubert: *See—*
Timmerman, Daniel Maurice; Thijs, Victor Jan; De Winter, Walter Frans; Claes, Frans Henri; and Vandenabeele, Hubert, 3,941,727.
van der Donck, Joseph J. M.: *See—*
Voskuil, Willem; and van der Donck, Joseph J. M., 3,941,845.
Vanderlei, Kenneth W.: *See—*
Miller, Howard R.; Putchinski, Leo J., Jr.; and Vanderlei, Kenneth W., 3,941,949.
vander Lely, Piet: *See—*
Grosemans, Jozef-Antoon; vander Lely, Piet; and Stigter, Willem Hendrik, 3,941,392.
van Esdonk, Johannes; and Hornman, Johannes Petrus, to U.S. Philips Corporation. Gas discharge panel. 3,942,061, Cl. 313-188.000.
Van Gils, Wilhelmus Martinus Jozef: *See—*
Winter, Frederik Nicolaas; and Van Gils, Wilhelmus Martinus Jozef, 3,942,063.
Van Goethem, Hugo Vital; Hazenbosch, Edwin Hendrik; and Poot, Albert Lucien, to AGFA-GEVAERT N.V. Complexing residual photosensitive polyhalogen compound with the tertiary amine. 3,941,598, Cl. 96-48.00R.
Van Malderghem, Edmund G., to Moore Business Forms, Inc. Envelope assembly. 3,941,307, Cl. 229-69.000.
Vanmunster, Richard H., to Monroe Belgium N.V. Plating rack. 3,941,674, Cl. 204-212.000.
Vannice, M. Albert; and Garten, Robert Lee, to Exxon Research and Engineering Company. Catalytic formation of hydrocarbons from CO hydrogen mixtures. 3,941,819, Cl. 260-449.00R.
van Os, Jan Lambert: *See—*
Lameris, Sophia Adriana; van Os, Jan Lambert; and Oostendorp, Joannes Gerard, 3,941,658.
Van Peppen, Jan F.: *See—*
Sifniades, Stylianos; Boyle, William J., Jr.; and Van Peppen, Jan F., 3,941,776.
van Steensel, Kees: *See—*
Gelsing, Richardus Johannes Henricus; and van Steensel, Kees, 3,942,187.
Varian Associates: *See—*
Klee, Richard E.; and Varozza, Joseph A., III, 3,940,994.
Varozza, Joseph A., III: *See—*
Klee, Richard E.; and Varozza, Joseph A., III, 3,940,994.
Vath, F. Leo: *See—*
DiGirolomo, John S.; Giuffre, Marino; Skees, Hugh B.; and Vath, F. Leo, 3,941,308.
VCA Corporation: *See—*
Bryan, James W., 3,941,489.
Vecchia, Gino Dalla, to Rimar S.p.A. Process for continuous paraffining of yarns. 3,941,897, Cl. 427-11.000.

Vedda, Louis; and Leclercq, Alain, to Institut de Recherches de la Siderurgie Francaise (IRSID). Liquid cooled electromagnetic continuous casting mold. 3,941,183, Cl. 164-147.000.
Veith, Werner: *See*—
Heynisch, Hinrich; and Veith, Werner, 3,942,136.
Velarde, Clyde R.; and Williams, Henry G., to Rheem Manufacturing Company. Clipper apparatus for attaching material to a broomstick or the like. 3,940,841, Cl. 29-243.560.
Velsicol Chemical Corporation: *See*—
Hokama, Takeo, 3,941,580.
Vencill, John J.: *See*—
Moor, Clinton H.; Stolwyk, Carl F.; and Vencill, John J., 3,942,135.
Verdol S.A.: *See*—
Neyraud, Rene, 3,941,161.
Vereinigte Osterreichische Eisen- und Stahlwerk-Alpine Montan Aktiengesellschaft: *See*—
Fastner, Thorwald, 3,940,976.
Vernik, Alexandr Borisovich: *See*—
Bondarenko, Oleg Petrovich; Medovar, Boris Izrailevich; Podola, Nikolai Vasilievich; Kravchuk, Anatoly Iosifovich; Marchenko, Alexandr Mikhailovich; Baglai, Vitaly Mikhailovich; Vernik, Alexandr Borisovich; Kamensky, Leonid Alexeevich; Us, Vasily Ivanovich; Mokhnach, Vladislav Konstantinovich; and Andrianov, Georgy Grigorievich, 3,942,105.
Ver Nooy, Burton; Payne, Larry D.; and Kendall, Robert L., to T. D. Williamson, Inc. Pipeline pig. 3,940,855, Cl. 33-174.00L.
Vesperman, William Charles: *See*—
Valia, Maheshkumar Parmananddas; and Vesperman, William Charles, 3,941,908.
Vetter, Craig W., to Vetter Design Works, Inc. Adjustable motorcycle sidecar mounting apparatus. 3,941,405, Cl. 280-203.000.
Vetter Design Works, Inc.: *See*—
Vetter, Craig W., 3,941,405.
Vicentini, Arnaldo; Maschi, Francesco; and Arrigoni, Guido, to Societa Italiana Telecomunicazioni Siemens S.p.A. Centralized debiting system for TDM telecommunication network. 3,941,935, Cl. 179-15.0AT.
Victor Company of Japan, Limited: *See*—
Muraoka, Teruo, 3,942,126.
Viets, Hermann, to United States of America, Air Force. Automatic boundary layer control in an ejector wing aircraft. 3,941,335, Cl. 244-42.0CC.
Vignau, Michel, to Roussel-UCLAF. Oxidation process. 3,941,811, Cl. 260-335.000.
Visser, James T.: *See*—
Baldwin, Ralph B.; and Visser, James T., 3,941,019.
Visual Planning Corporation: *See*—
Josephson, Joseph Pollack, 3,942,147.
Vitelli, Vito J., to Morgan Construction Company. Apparatus for controlled cooling hot rolled steel rod in direct sequence with rod mill. 3,940,967, Cl. 72-201.000.
Vits, Hilmar, to VITS-Maschinenbau GmbH. Arrangement for the stackwise depositing of separate equally-long sheets on a repository. 3,941,374, Cl. 271-183.000.
VITS-Maschinenbau GmbH: *See*—
Vits, Hilmar, 3,941,374.
Vitt, Theodor: *See*—
Grunert, Hellmuth; and Vitt, Theodor, 3,940,829.
Vogel, Christian: *See*—
Sturm, Elmar; Cellarius, Hans Joerg; and Vogel, Christian, 3,941,579.
Volkov, Mstislav Vasilievich; and Oganesian, Oganes Vardanovich. Apparatus for joint movement restitution. 3,941,123, Cl. 128-84.00B.
Volkov, Vladimir Vasilievich: *See*—
Konstantinov, Alexei Kirillovich; Volkov, Vladimir Vasilievich; Gaschenko, Viktor Petrovich; Lukashkov, Igor Vladimirovich; Klitsov, Alexandr Abramovich; and Kuzmenko, Valentin Timofeevich, 3,940,813.
Volkswagenwerk Aktiengesellschaft: *See*—
Bensch, Gotthard; Ehrich, Gustav; and Fendler, Peter, 3,941,100.
Volle, Everette Michael: *See*—
Moser, Raymond L.; and Volle, Everette Michael, 3,941,262.
Vollheim, Gerhard; Troger, Karl-Jurgen; and Lippert, Gerhard, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the production of a catalyst comprising a novel metal on activated carbon. 3,941,717, Cl. 252-430.000.
von Bebenburg, Walter; and Offermanns, Heribert, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. 6-Aza-3H-1,4-benzodiazepines. 3,941,775, Cl. 260-239.30B.
von Braun, Leo: *See*—
Bellino, Joseph A.; and von Braun, Leo, 3,941,230.
von Rintelen, Harald: *See*—
Ranz, Erwin; Lapp, Otto; Moisar, Erik; and von Rintelen, Harald, 3,941,595.
Von Semel, Georg; Schibilla, Eduard; and Strewe, Wolfgang, to Friedrich Uhde GmbH. Method for the reprocessing of cell liquor from diaphragm cell electrolysis plants. 3,941,667, Cl. 204-98.000.
von Sturm, Ferdinand; and Richter, Gerhard, to Siemens Aktiengesellschaft. Pacemaker with biofuel cell. 3,941,135, Cl. 128-419.0PS.
Voross, Zoltan; Caruti, James R.; and Leung, Yam C., to Sun Electric Corporation. Signal disabling engine diagnosing apparatus. 3,940,977, Cl. 73-116.000.
Voskuil, Willem; and van der Donck, Joseph J. M., to Stamicarbon, B.V. Process for preparing cycloalkanones and cycloalkanols. 3,941,845, Cl. 260-586.00R.
Voss, Raymond G.: *See*—
Lenker, Paul E.; and Voss, Raymond G., 3,941,017.
Voss, Robert H.; Ward, Earl M.; and Spetz, William L., to Mosler Safe Company, The. Off-line cash dispenser and banking system. 3,941,977, Cl. 235-61.70B.
Vredenbregt, Jakob; Klomp, Antonius Maria; and Hurkmans, Adrianus Cornelis Maria, to U.S. Philips Corporation. Ambulatory stimulator. 3,941,137, Cl. 128-423.00R.
Vyskumny ustav mechanizacia a automatizacie: *See*—
Figura, Zdeno, 3,942,052.
W. R. Grace & Co.: *See*—
Lowther, Frank Eugene, 3,942,093.
W. Schlafhorst & Co.: *See*—
Strunk, Toni, 3,941,320.
Waaske, Heinz, to Rollei-Werke Franke & Heidecke. Miniature motion picture camera. 3,941,464, Cl. 352-72.000.
Wacker-Chemie GmbH: *See*—
Barth, Hans Jochen, 3,941,544.
Bosch, Erhard; Pirson, Ewald; and Roth, Michael, 3,941,864.
Wain, Harry C. Faceting device for gemstones. 3,940,888, Cl. 51-229.000.
Wakabayashi, Hiroshi; Nakagawa, Toru; Matsumura, Shoichi; and Fujii, Shigeru, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Method for production of copolymer of cyclopentene. 3,941,757, Cl. 260-80.780.
Walker, David D.: *See*—
Benjamin, Milton L.; and Walker, David D., 3,941,014.
Wallace, Charles H.: *See*—
Sourby, John C.; and Wallace, Charles H., 3,940,998.
Wallach, Donald Francis Hoelzl: *See*—
Munder, Paul Gerhard; Modolell, Manuel; and Wallach, Donald Francis Hoelzl, 3,941,662.
Wallenfang, Jerome A.; and Witt, Wilmer E., to Koehring Company. Row crop harvesting apparatus. 3,940,913, Cl. 56-98.000.
Wallin, Erik Gunnar, to Mo och Domsjo Aktiebolag. Process for obtaining a predetermined Kappa number in sulfate pulping. 3,941,649, Cl. 162-19.000.
Wallis, Craig: *See*—
Melnick, Joseph L.; and Wallis, Craig, 3,941,696.
Walser, Armin: *See*—
Surmatis, Joseph Donald; and Walser, Armin, 3,941,841.
Walter Kidde & Company, Inc.: *See*—
Everson, Evan Philip, 3,940,918.
Walter, Lothar: *See*—
Schurger, Rainer; Burkl, Erich; and Walter, Lothar, 3,941,434.
Walters, Frank: *See*—
Krebs, Peter Eric; and Walters, Frank, 3,942,071.
Walters, Russell W., to BMR Security Products Corporation. Bar lock assembly modifications. 3,940,957, Cl. 70-104.000.
Walworth, Bryant Leonidas: *See*—
Cross, Barrington; and Walworth, Bryant Leonidas, 3,941,881.
Walworth, Vivian K., to Polaroid Corporation. Method of forming a photographic emulsion layer. 3,941,600, Cl. 96-80.000.
Wanat, Robert R., to Teletype Corporation. Apparatus for positioning a web. 3,941,288, Cl. 226-74.000.
Wang, Tsu-Huai; and Key, Edgar T., to Seton Company. Plastic laminate, article and method of making same. 3,941,633, Cl. 156-77.000.
Wankel GmbH: *See*—
Seufer, Theo; and van Basshuysen, Richard, 3,941,097.
Wilmers, Gottlieb; and Maurhoff, Gerhard, 3,941,525.
Ward, Earl M.: *See*—
Voss, Robert H.; Ward, Earl M.; and Spetz, William L., 3,941,977.
Ward, John E.; Silvey, John O.; and Roberge, James K., to Massachusetts Institute of Technology. High-accuracy optical torquemeter. 3,940,979, Cl. 73-136.00A.
Warn Industries, Inc.: *See*—
Williams, Richard D., 3,941,199.
Warnke, Heinrich: *See*—
Kaup, Friedel; and Warnke, Heinrich, 3,941,147.
Warren, Williams S.: *See*—
Rothwell, Jack L.; and Warren, Williams S., 3,941,428.
Warwick Electronics, Inc.: *See*—
Brand, John R.; and Mate, David J., 3,941,024.
Washburn, John M., to Merrow Machine Company, The. Thread control for overedge sewing machine. 3,941,068, Cl. 112-162.000.
Watanabe, Atsushi: *See*—
Tshida, Naoyashi; Watanabe, Atsushi; and Ishii, Yukio, 3,941,115.
Watanabe, Rikizo, to Hitachi Metals, Ltd. Precipitation hardening Ni base alloy. 3,941,590, Cl. 75-171.000.
Watanabe, Tadao, to Hitachi, Ltd. Electron scanning apparatus. 3,942,005, Cl. 250-310.000.
Watatani, Yoshizumi: *See*—
Mohri, Katsuo; Watatani, Yoshizumi; Nabeyama, Hiroaki; and Yoshino, Takehiko, 3,941,930.
Watkinson, Alan Paul: *See*—
Wilkomirsky, Igor A.; Watkinson, Alan Paul; and Brimacombe, J. Keith, 3,941,867.
Watson, John T.: *See*—
Stumpf, Kenneth D.; and Watson, John T., 3,942,022.
Wean United, Inc.: *See*—
Greenberger, Joseph Irwin, 3,941,611.
Weatherston, Roger C., to Calspan Corporation. Rotary compressor. 3,941,521, Cl. 418-9.000.

Webber, Philip S.; and Franz, Maurice F., to Caterpillar Tractor Co. Control system for shifting a drive transmission. 3,941,007, Cl. 74-340.000.
Weber, Russell W. Fishing device. 3,940,872, Cl. 43-43.130.
Webster, Ronald B.; Carulli, Vincent J.; and Wood, Kenneth O., to Gerber Scientific Instrument Company, The. Work locating system and method with temperature and other compensation capabilities. 3,941,480, Cl. 356-106.00R.
Wedemeyer, Karlfried: *See—*
Pelz, Willibald; Credner, Hans-Heinrich; Schulte, Walter; Klein, Alfons; Wedemeyer, Karlfried; and Nittel, Fritz, 3,941,601.
Weghaupt, Erich: *See—*
Abolins, Arnold; Massar, Ernst; and Weghaupt, Erich, 3,942,053.
Wegmann & Co.: *See—*
Schindehutte, Manfred; and Dieling, Hans, 3,941,061.
Wehr Corporation: *See—*
Travaglio, Dalny; Dravnieks, Konstantins; and Sylvester, Gordon C., 3,941,310.
Wehrli, Pius Anton, to Hoffmann-La Roche Inc. Synthesis of 2-methyl-3-buten-2-ol. 3,941,852, Cl. 260-643.00R.
Weibelzahl, Manfred, to Siemens Aktiengesellschaft. Method and apparatus for operating a converter fed rotating field machine. 3,942,091, Cl. 321-5.000.
Weikert, Roy J. A system of interconnected, sealed and unsealed bags. 3,941,306, Cl. 229-53.000.
Weil-McLain Company, Inc.: *See—*
Hiller, Trueman W.; and Jarr, Klaus D., 3,941,168.
Weinmann Aktiengesellschaft: *See—*
Schoch, Robert, 3,941,215.
Weinshenker, Ned M., to Alza Corporation. Pharmaceutical compositions containing crystalline racemic 9α, 11α, 15(S)-trihydroxy-5-cis, 13-trans-prostadienoic acid. 3,941,886, Cl. 424-317.000.
Weis, Edmund B., Jr.; Hassler, Craig R.; and Flora, John H., to Battelle Memorial Institute. Method and system for control of a powered prosthetic device. 3,940,803, Cl. 3-1.100.
Weis, Frank G., to Ecodyne Corporation. Grit selector. 3,941,698, Cl. 210-208.000.
Weiss, Eberhard, to International Standard Electric Corporation. Method of producing an insulating material for coating cathode heater elements. 3,941,707, Cl. 252-62.000.
Weissman, Bernard. Drilling machine for plaster casts or models. 3,941,496, Cl. 408-130.000.
Weldes, Helmut H., to Philadelphia Quartz Company. Crystallized alkali metal silicate with sequestering agents. 3,941,723, Cl. 252-527.000.
Wells, Daniel M.; and Tarrant, James H., to Farmer Bros. Co. Automatic coffee brewing system. 3,941,042, Cl. 99-289.00R.
Welsh, Paul Bryce, to Du Pont de Nemours, E. I., and Company. Yarn extraction and washing apparatus. 3,940,955, Cl. 68-20.000.
Welstead, William John, Jr.; and Chen, Ying-Ho, to A. H. Robins Company. 7-(α-Acetylbenzyl)indoline. 3,941,806, Cl. 260-326.11R.
Welton, Wright M., Jr., to PPG Industries, Inc. Method and apparatus for making molten glass with batch guiding means. 3,941,576, Cl. 65-135.000.
Wennerblom, Bengt Axel; and Svensson, Gustav Robert, to Svenska Cellulosa Aktiebolaget. Method of making surface-treated paper. 3,941,902, Cl. 427-172.000.
Werner, Edward E.; and Mitchell, Jerome L., to Kimberly-Clark Corporation. Attrition mill and method of fibrous web formation. 3,940,831, Cl. 19-156.300.
West, William J.: *See—*
Misson, William W.; Studley, Clarence K.; West, William J.; and Liljenwall, Edward T., 3,941,953.
Westates Space-Era Products, Inc.: *See—*
Anderson, Frank R.; and Castro, Albert J., 3,941,150.
Westbrook, Carl M. Rotary seal shaft rotation transducer. 3,942,112, Cl. 324-166.000.
Western Electric Company, Inc.: *See—*
Burns, John Andrew; and Sivo, Andrew Robert, Jr., 3,941,297.
Gerhard, Allen Robert, 3,942,107.
Valia, Maheshkumar Parmananddas; and Vesperman, William Charles, 3,941,908.
Westfall, Wilmer J., Jr., to Texas Instruments Incorporated. Solid state depth sounder. 3,942,149, Cl. 340-3.00R.
Westinghouse Electric Corporation: *See—*
Barbieri, Thomas; Getz, Edward J.; and Wilson, Alfred W., 3,941,304.
Bennett, Allan I., 3,942,131.
Boyce, Walter A., 3,941,604.
Charlton, Thomas, 3,941,438.
Cooper, Herbert Warren; and deKlerk, John, 3,942,139.
Dazen, John R.; and Denero, John V., 3,940,908.
Dimmick, George D.; Rhodes, Kevin J.; and Uzumecki, Richard W., 3,942,064.
Frost, Lawrence W., 3,941,749.
Glenn, Robert G., 3,941,500.
Jackovitz, John F.; and Pantier, Earl A., 3,941,614.
James, Frank W., Jr., 3,941,971.
Maxey, Robert E. L., 3,940,854.
Mayer, Donald K., 3,941,012.
McAvoy, Bruce R.; and Driver, Michael C., 3,942,186.
Philofsky, Harold M.; and Wu, Julius J., 3,942,057.
Thorp, Arthur G., II, deceased, 3,941,653.
Whyte, Ian A., 3,942,168.
Whyte, Ian A., 3,942,170.
Wyler, John S., 3,940,985.
Wethe, Harry K.: *See—*
Hedlund, Harland R.; and Wethe, Harry K., 3,940,889.
Wethington, Charles A., to Deering Milliken Research Corporation. Carpet machine. 3,941,645, Cl. 156-435.000.
Wetzel, Wilfred W.; and Darr, Ralph M., to White, Deloy J. Method of producing a colored film from a black-and-white picture. 3,941,463, Cl. 352-38.000.
Wharton, Walter W.: *See—*
Phillips, John F.; Murfree, James A., Jr.; Wharton, Walter W.; and Duncan, William A., 3,941,626.
Wheat, Richard P.: *See—*
Bowden, James E.; and Kesterson, Robert H., 3,941,165.
Wheeler, Bryce A., to Hughes Aircraft Company. Thermal imaging system with redundant object space scanning. 3,941,923, Cl. 178-6.800.
Whirlpool Corporation: *See—*
Pfouts, John Richard, 3,942,111.
Spiegel, Raymond William, 3,941,139.
Traube, John Harry; and Sherer, R. Bruce, 3,941,153.
White, Allen A.: *See—*
Garrison, Harold Keith; Case, Cecil L.; and White, Allen A., 3,941,003.
White, Deloy J.: *See—*
Wetzel, Wilfred W.; and Darr, Ralph M., 3,941,463.
White, Gene: *See—*
Medgebow, Irving; and White, Gene, 3,941,295.
White, Harold V.: *See—*
Stripling, William W.; White, Harold V.; and Hunter, Joe S., 3,941,345.
White, Nicholas J.: *See—*
Nehrig, R. Harlan; and White, Nicholas J., 3,941,352.
Whitehead, Frank R., to G. D. Searle & Co. Use of modulated stimulus to improve detection sensitivity for signals from particles in a flow chamber. 3,941,479, Cl. 356-102.000.
Whiteside, George D., to Polaroid Corporation. Camera with pivoting blades. 3,942,183, Cl. 354-29.000.
Whiteside, George D.: *See—*
Blinow, Igor; Johnson, Bruce K.; and Whiteside, George D., 3,942,184.
Whiting, Keith D. E.: *See—*
Sankey, George H.; and Whiting, Keith D. E., 3,941,796.
Whittaker Corporation: *See—*
Tasker, Homer G.; and Green, William F., 3,940,980.
Whyte, Ian A., to Westinghouse Electric Corporation. Distribution network power line communication system. 3,942,168, Cl. 340-310.00R.
Whyte, Ian A., to Westinghouse Electric Corporation. Distribution network powerline carrier communication system. 3,942,170, Cl. 340-310.00A.
Wiedermann, Rolf; and La Spina, Andrea, to Bayer Aktiengesellschaft. Polyguanidine foams. 3,941,726, Cl. 260-2.50N.
Wiese, Brian Leslie: *See—*
Clancy, John Mathew; Howard, Rodney William; Wiese, Brian Leslie; Hipsley, Richard Eben; and Kennedy, Christopher Patrick, 3,941,045.
Wiese, John M., to Singer Company, The. Hot air furnace with improved heat exchanger construction. 3,940,837, Cl. 29-157.500.
Wiese, Winfred J.: *See—*
Ball, Rowland E.; and Wiese, Winfred J., 3,941,395.
Wilbur, Charles J., to Quaker Oats Company, The. Shipping case. 3,941,303, Cl. 229-37.00E.
Wilkomirsky, Igor A.; Watkinson, Alan Paul; and Brimacombe, J. Keith, to Canadian Patents and Development Limited. Production of molybdenum trioxide from molybdenite in a fluidized bed. 3,941,867, Cl. 423-53.000.
Will, Gerhard, to Robert Bosch G.m.b.H. Load and speed dependent gear change hydraulic pressure generator. 3,941,016, Cl. 74-867.000.
William H. Rorer, Inc.: *See—*
Diamond, Julius; and Santora, Norman Julian, 3,941,821.
William Prym-Werke KG: *See—*
Glindmeyer, Friedrich; Hennenberg, Wilhelm Friedrich; and Limpens, Karl, 3,941,163.
Williams, Henry G.: *See—*
Velarde, Clyde R.; and Williams, Henry G., 3,940,841.
Williams, Jimmy L., to Glass Master Corporation. Board cutting machine. 3,941,018, Cl. 83-5.000.
Williams, Richard D., to Warn Industries, Inc. Power transmission for a vehicle. 3,941,199, Cl. 180-44.00R.
Willow Technology, Inc.: *See—*
Wurtz, William O., 3,941,357.
Wilmers, Gottlieb; and Maurhoff, Gerhard, to Audi NSU Auto Union Aktiengesellschaft; and Wankel GmbH. Internal seal for the piston of a rotary piston engine. 3,941,525, Cl. 418-142.000.
Wilson, Alfred W.: *See—*
Barbieri, Thomas; Getz, Edward J.; and Wilson, Alfred W., 3,941,304.
Wilson, James A., to Exxon Research and Engineering Company. Remote engine speed indicator system. 3,942,113, Cl. 324-170.000.
Wilson Miller & Co., Ltd.: *See—*
Miller, Albert Arthur, 3,941,013.
Wiltron Company: *See—*
Dunwoodie, Duane E.; and Oliver, Wallace, 3,941,950.
Winnebago Industries, Inc.: *See—*
Thill, Timothy N., 3,941,180.

Winner, Marvin R.: *See*—
Peterson, Eugene W.; Wurtz, Howard P., Jr.; and Winner, Marvin R., 3,942,010.

Winter, Frederik Nicolaas; and Van Gils, Wilhelmus Martinus Jozef, to U.S. Philips Corporation. Incandescent lamp having increased life. 3,942,063, Cl. 313-315.000.

Winters, Paul A. Pet sanitizer. 3,941,092, Cl. 119-19.000.

Wintringham, Robert E. Magnetic captive key switch lock. 3,941,954, Cl. 200-44.000.

Witt, Wilmer E.: *See*—
Wallenfang, Jerome A.; and Witt, Wilmer E., 3,940,913.

Witten, Arthur L.: *See*—
Bourbeau, Frank J.; Meredith, Barton L.; and Witten, Arthur L., 3,942,092.

Wittschen, Robert F.: *See*—
Tavelle, Charles L.; and Wittschen, Robert F., 3,941,635.

Wittwer, Christian; and Bonometti, Emil, to Ciba-Geigy AG. Process for the manufacture of symmetric 1:2 chromium complexes of azo dyes. 3,941,765, Cl. 260-151.000.

Wold, Ivar, to Analog Devices, Inc. Offset error compensation for integrating analog-to-digital converter. 3,942,173, Cl. 340-347.0NT.

Wolejsza, Chester Joseph, Jr., to Communications Satellite Corporation (COMSAT). Dual pilot redundant AFC system for satellite communications system. 3,942,115, Cl. 325-4.000.

Wolf, Siegfried G., to Gulf & Western Manufacturing Company. Article turning device. 3,941,255, Cl. 214-1.0QG.

Wolf X-Ray Corporation: *See*—
Schatz, Joseph S., 3,942,016.

Wood, Kenneth O.: *See*—
Webster, Ronald B.; Carulli, Vincent J.; and Wood, Kenneth O., 3,941,480.

Woodhouse, John Carrick. Machine for dispensing coinage change. 3,941,138, Cl. 133-2.000.

Woodward, Robert Burns, to Ciba-Geigy Corporation. Dioxatricyclodecanes and process for their manufacture. 3,941,813, Cl. 260-340.700.

Wopschall, Paul R. Balloon carried basket for ball game. 3,941,384, Cl. 273-105.00R.

Word, Elizabeth L.: *See*—
Cunnane, Francis J., III; and Word, Elizabeth L., 3,941,559.

Worden, Donald A., to Marotta Scientific Controls, Inc. Automatic pressure control system. 3,941,508, Cl. 417-46.000.

Wright, Ian G., to Eli Lilly and Company. Preparation of 3-alkylthiomethyl cephalosporins. 3,941,781, Cl. 260-243.00C.

Wright, Pat: *See*—
Sayer, Wayne L.; and Wright, Pat, 3,942,101.

Wu, Julius J.: *See*—
Philofsky, Harold M.; and Wu, Julius J., 3,942,057.

Wu, Souheng, to Du Pont de Nemours, E. I., and Company. Polyvinylchloride/olefin copolymers stabilized with epoxy resin. 3,941,857, Cl. 260-837.0PV.

Wudl, Fred: *See*—
Kaplan, Martin Louis; and Wudl, Fred, 3,941,809.

Wudyka, Joseph Paul: *See*—
Bradbury, Christopher Grover; Gotham, Stanley Thomas; and Wudyka, Joseph Paul, 3,941,684.

Wurlitzer Company, The: *See*—
Drakes, Russell J., 3,941,226.
Thomas, Howard M.; and Borowiec, Richard A., 3,941,023.

Wurtz, Howard P., Jr.: *See*—
Peterson, Eugene W.; Wurtz, Howard P., Jr.; and Winner, Marvin R., 3,942,010.

Wurtz, William O., to Willow Technology, Inc. Method and apparatus for mixing viscous materials. 3,941,357, Cl. 259-104.000.

Wuskell, Joseph P.: *See*—
Brindell, Gordon D.; and Wuskell, Joseph P., 3,941,850.

Wust, Olivier: *See*—
Bosshard, Peter; Portmann, Werner; and Wust, Olivier, 3,941,321.

Wyler, John S., to Westinghouse Electric Corporation. Fluid flow measurement system for pipes. 3,940,985, Cl. 73-194.00A.

Xerox Corporation: *See*—
Brodesser, Gerd R., 3,941,006.
Cross, Thomas R.; and George, Clifford L., 3,941,369.
Goffe, William L., 3,941,473.
Gundlach, Robert W., 3,941,280.
Hattler, Louis R.; and Bar-on, Ari, 3,941,085.
Hayne, Thomas F., 3,942,006.
Hudson, Frederick W., 3,940,997.
Liechty, Karl E.; and Lasher, David C., 3,941,376.
Limburg, William W., 3,941,750.
McGuire, John V.; and Mitchell, Robert L., 3,940,904.
Mock, Howard C.; Isaac, Kenneth N.; Disparte, Charles P.; and Hall, Warren L., 3,942,156.
Saeva, Franklin D., 3,942,007.
Shah, Naginchand A., 3,941,470.
Stange, Klaus K., 3,941,373.

Xicon Data Entry Corporation: *See*—
La White, Eric L.; Henrichon, Ernest G., Jr.; and Bloom, Harvey J., 3,941,375.

Yagi, Shizuo; and Asaka, Urataro, to Honda Giken Kogyo Kabushiki Kaisha. Exhaust gas recirculation for three-valve engine. 3,941,105, Cl. 123-119.00A.

Yagi, Toshio: *See*—
Sasame, Takao; and Yagi, Toshio, 3,941,569.

Yale, Ramon L.: *See*—
Mathers, James E.; Yale, Ramon L.; and Layman, H. David, 3,941,714.

Yamada, Katsumi. Razor blade container for single edge blades for use in straight edge type razor. 3,941,243, Cl. 206-359.000.

Yamada, Mamoru: *See*—
Itoh, Hayami; Yamada, Mamoru; and Nozaki, Yasuo, 3,941,066.

Yamada, Munemitsu: *See*—
Okada, Ryozo; Iuchi, Munenori; and Yamada, Munemitsu, 3,941,177.

Yamagoshi, Tanoshi: *See*—
Tajima, Shigeru; Shimamura, Takeshi; Matsumoto, Kojiro; Sekiguchi, Sadao; Yamagoshi, Tanoshi; and Fjieda, Kazumasa, 3,941,912.

Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Sekiguchi, Tomoaki, 3,941,110.

Yamaji, Nobuyuki: *See*—
Ishiyama, Jiro; Yokotsuka, Tamotsu; Kato, Motohiko; Yamaji, Nobuyuki; and Yoshida, Fumihiko, 3,941,770.

Yamamoto, Hideaki: *See*—
Tanaka, Yasuo; Yamamoto, Hideaki; Ooki, Keiko; Goto, Naohiro; and Takigawa, Toru, 3,941,672.

Yamamoto, Shizuo; Nagai, Yuichi; Shimizu, Nobuyuki; and Tajimi, Hiroshi, to Chiyoda Chemical Engineering & Construction Co. Ltd. Earthquake isolating and vibration absorbing equipment for structures. 3,940,895, Cl. 52-167.000.

Yamasaki, Hiroo; Ito, Ichizo; and Shibata, Yukitake, to Yokogawa Electric Works, Ltd. Flow Velocity measuring device. 3,940,986, Cl. 73-194.0VS.

Yamashita, Toshiharu, to Hoya Glass Works, Ltd.; and Hoya Lens Co., Ltd. Reversible light-sensitive glass. 3,941,605, Cl. 106-47.00Q.

Yanagi, Osamu: *See*—
Kurii, Masaaki; Kobari, Kiyoshi; and Yanagi, Osamu, 3,941,204.

Yanagisawa, Hifumi: *See*—
Umeya, Eiji; and Yanagisawa, Hifumi, 3,941,960.

Yankowski, Anthony P.; and Klausner, Arnold. Electromagnetic shock absorber. 3,941,402, Cl. 280-124.00R.

Yano, Norio: *See*—
Kato, Katsuhiro; Suzuki, Hideo; Yano, Norio; Kishimoto, Yojiro; and Ishiguro, Ginya, 3,942,142.

Yasuda, Michio: *See*—
Fujimoto, Yoshiji; Kadota, Shozo; Yasuda, Michio; Hayashi, Shinichi; and Hananoi, Toshihiro, 3,942,169.

Yasuda, Tetuya; Yoshida, Makoto; Mochizuki, Yoshifumi; and Morokawa, Shigeru, to Citizen Watch Co., Ltd. Electronic wristwatch with electronic sound emitter device. 3,940,919, Cl. 58-38.00R.

Yates, David J. C.: *See*—
Kmak, Walter S.; and Yates, David J. C., 3,941,682.

Yatsu, Lawrence Y.: *See*—
Hensarling, Thomas P.; Jacks, Thomas J.; and Yatsu, Lawrence Y., 3,941,764.

Yazaki, Yoshimi. Resin coated steel pipe and the process and equipment for its production. 3,941,087, Cl. 118-306.000.

Yeager, William J., to R. E. Chapin Manufacturing Works, Inc. Method of forming an extension tube assembly. 3,940,843, Cl. 29-437.000.

Yoder, Alan C., to Bowmar Instrument Corporation. Push-button type binary switch device. 3,941,964, Cl. 200-159.00A.

Yokogawa Electric Works, Ltd.: *See*—
Yamasaki, Hiroo; Ito, Ichizo; and Shibata, Yukitake, 3,940,986.

Yokotsuka, Tamotsu: *See*—
Ishiyama, Jiro; Yokotsuka, Tamotsu; Kato, Motohiko; Yamaji, Nobuyuki; and Yoshida, Fumihiko, 3,941,770.

Yoldas, Bulent E., to Owens-Illinois, Inc. Transparent activated nonparticulate alumina and method of preparing same. 3,941,719, Cl. 252-463.000.

Yonemitsu, Isao David: *See*—
Tarasuk, Walter Renald; and Yonemitsu, Isao David, 3,941,654.

Yoshida, Fumihiko: *See*—
Ishiyama, Jiro; Yokotsuka, Tamotsu; Kato, Motohiko; Yamaji, Nobuyuki; and Yoshida, Fumihiko, 3,941,770.

Yoshida, Kunio: *See*—
Tsuchiya, Hiroyoshi; Yoshida, Kunio; Tsuda, Yukifumi; Hayami, Heijiro; and Kotera, Hiroaki, 3,941,922.

Yoshida, Makoto: *See*—
Yasuda, Tetuya; Yoshida, Makoto; Mochizuki, Yoshifumi; and Morokawa, Shigeru, 3,940,919.

Yoshimatsu, Toshio: *See*—
Ohmiya, Shoji; and Yoshimatsu, Toshio, 3,941,391.

Yoshimura, Kiyotaka: *See*—
Asano, Shiro; Yoshimura, Kiyotaka; and Hashimoto, Masao, 3,941,837.

Yoshino, Takehiko: *See*—
Mohri, Katsuo; Fukuda, Masaaki; Kayano, Tatsuo; and Yoshino, Takehiko, 3,941,920.
Mohri, Katsuo; Watatani, Yoshizumi; Nabeyama, Hiroaki; and Yoshino, Takehiko, 3,941,930.

Yoshioka, Takao: *See*—
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Toda, Toshimasa; Mori, Eiko; Horiuchi, Hideo; Higashida, Susumu; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohata, Noriyuki; and Ohsawa, Hisayou, 3,941,744.

Yoshitake, Masami: *See*—
Saegusa, Hitoshi; and Yoshitake, Masami, 3,941,681.

Yoshsii, Hiroshi: *See*—
Yukuta, Toshio; Ohashi, Takashi; and Yoshsii, Hiroshi, 3,941,732.

Yosioka, Takayuki; Komada, Tadashi; Sugano, Akira; and Fukumaru, Takafumi, to Hitachi, Ltd. Proportional-integral circuit having means for change-over between automatic mode and handling mode. 3,942,088, Cl. 318-591.000.

Young, Christopher; and Maynard, John T., to Armor Elevator Company, Inc. Control system for a transportation system. 3,941,214, Cl. 187-29.00R.

Young, Marian G.: *See*—
Slusarchyk, William A.; Dolfini, Joseph Edward; and Young, Marian G., 3,941,779.

Younkin, James R., to Edo-Aire Mitchell Industries, Inc. Flight instrument. 3,940,990, Cl. 73-387.000.

Yu, Robert Tapei, to Motorola, Inc. Bit sense line speed-up circuit for MOS RAM. 3,942,160, Cl. 340-173.00R.

Yukuta, Toshio; Ohashi, Takashi; and Yoshsii, Hiroshi, to Bridgestone Tire Company Limited. Vulcanizable rubber composition having improved physical properties. 3,941,732, Cl. 260-23.70B.

Yukuta, Toshio; Kojima, Minoru; Onishi, Akira; and Kanbara, Shu, to Bridgestone Tire Company Limited. Aldehyde functional polymers. 3,941,847, Cl. 260-601.00R.

Yumde, Yasufumi; and Furuhata, Takashi, to Hitachi, Ltd. System for converting frequency band of picture signal. 3,941,921, Cl. 178-6.000.

Zaccaira, Michael Frank. Mousetrap. 3,940,876, Cl. 43-131.000.

Zanella, Dominic A.: *See*—
Renfrew, Edgar E.; and Zanella, Dominic A., 3,941,560.

Zapf, Otto, to Knoll International, Inc. Welt Construction. 3,940,812, Cl. 5-360.

Zarges, Frank: *See*—
Zarges, Walther; and Zarges, Frank, 3,941,271.

Zarges, Walther; and Zarges, Frank, to Zarges, Walther. Collapsible receptacle. 3,941,271, Cl. 220-6.000.

Zenith Radio Corporation: *See*—
Gaind, Jagjit R., 3,941,928.

Zielinski, Stanley A.: *See*—
Slobodzian, Gregory E.; Zielinski, Stanley A.; and Payne, Robert A., 3,941,926.

Ziemek, Gerhard, to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft. Process for manufacturing flexible tubing capable of withstanding substantial pressures and flexible metal tubing made thereby. 3,941,296, Cl. 228-148.000.

Zimmermann & Jansen GmbH: *See*—
Schneider, Heinz, 3,941,186.

Zinn, Mortimer H., to United States of America, Army. Combined electron beam semiconductor modulator and junction laser. 3,942,132, Cl. 331-94.50H.

Zinpro Corporation: *See*—
Abdel-Monem, Mahmoud M., 3,941,818.

Zirker, Guenter: *See*—
Broecker, Franz Josef; Zirker, Guenter; Triebskorn, Bruno; Marosi, Laszlo; Schwarzmann, Matthias; Dethlefsen, Winfried; and Kaempfer, Knut, 3,941,721.

Zoltan, Istvan: *See*—
Ronafoldi, Arnold; and Zoltan, Istvan, 3,941,088.

Zukowski, Edward C.: *See*—
Blount, Richard; Cote, Paul T.; and Zukowski, Edward C., 3,941,992.

LIST OF DEFENSIVE PUBLICATIONS

APPLICANTS TO WHOM

DEFENSIVE PUBLICATIONS WERE ISSUED ON THE 2ND DAY OF MARCH, 1976

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687.

Altman, Carl, S. G. Chapman, and A. V. S. Satya, to International Business Machines Corp. Device to improve the reverse leakage characteristics in metal semiconductor contacts. T944,004, 3–2–76, Cl. 357—15.

Beckman, Joseph A.: *See*—
Roberts, Durward T., Jr., Beckman, Calihan, and Halasa. T944,010.

Booth, Robert M., Jr., R. R. Elam, L. W. Holmstrom, K. W. Lallier, L. K. Lange, C. U. Lee, E. I. Muehldorf, P. Puri, W. Rosenbluth, and A. D. Savkar, to International Business Machines Corp. Testing system and processes for manufacturing complex articles. T944,007, 3–2–76, Cl. 444—1.

Brewer, Richard J., R. A. Chambers, and B. S. Wininger. Hot melt adhesive. T944,005, 3–2–76, Cl. 106—80.

Calihan, Lawrence E.: *See*—
Roberts, Durward T., Jr., Beckman, Calihan, and Halasa. T944,010.

Chambers, Ralph A.: *See*—
Brewer, Richard J., Chambers, and Wininger. T944,005.

Chapman, Syndey G.: *See*—
Altman, Carl, Chapman, and Satya. T944,004.

Couling, Sidney L., to The Dow Chemical Co. Magnesium base die casting alloy. T944,006, 3–2–76, Cl. 75—168.

Crabtree, Michael: *See*—
Roberts, Richard J., and Crabtree. T944,003.

Dow Chemical Co., The: *See*—
Couling, Sidney L. T944,006.

Elam, Robert R.: *See*—
Booth, Robert M., Jr., Elam, Holmstrom, Lallier, Lange, Lee, Muehldorf, Puri, Rosenbluth, and Savkar. T944,-007.

Firestone Tire & Rubber Co., The: *See*—
Roberts, Durward T., Jr., Beckman, Calihan, and Halasa. T944,010.

Halasa, Adel F.: *See*—
Roberts, Durward T., Jr., Beckman, Calihan, and Halasa. T944,010.

Hanan, Maurice, and P. K. Wolff, Sr., to International Business Machines Corp. Automated system and method for partitioning and mapping circuit units onto modules including an iterative process. T944,001, 3–2–76, Cl. 444—1.

Holmstrom, Larry W.: *See*—
Booth, Robert M., Jr., Elam, Holmstrom, Lallier, Lange, Lee, Muehldorf, Puri, Rosenbluth, and Savkar. T944,-007.

International Business Machines Corp.: *See*—
Altman, Carl, Chapman, and Satya. T944,004.
Booth, Robert M., Jr., Elam, Holmstrom, Lallier, Lange, Lee, Muehldorf, Puri, Rosenbluth, and Savkar. T944,-007.
Hanan, Maurice, and Wolff. T944,001.
Naylor, Hugh E., III. T944,009.
Woodrum, Luther J. T944,002.

Lallier, Keith W.: *See*—
Booth, Robert M., Jr., Elam, Holmstrom, Lallier, Lange, Lee, Muehldorf, Puri, Rosenbluth, and Savkar. T944,-007.

Lange, Lawrence K.: *See*—
Booth, Robert M., Jr., Elam, Holmstrom, Lallier, Lange, Lee, Muehldorf, Puri, Rosenbluth, and Savkar. T944,-007.

Lee, Chung Up: *See*—
Booth, Robert M., Jr., Elam, Holmstrom, Lallier, Lange, Lee, Muehldorf, Puri, Rosenbluth, and Savkar. T944,-007.

Muehldorf, Eugen I.: *See*—
Booth, Robert M., Jr., Elam, Holmstrom, Lallier, Lange, Lee, Muehldorf, Puri, Rosenbluth, and Savkar. T944,-007.

Naylor, Hugh E., III, to International Business Machines Corp. Ink jet system using dual gutters to reduce aerodynamic effects. T944,009, 3–2–76, Cl. 346—75.

Puri, Prem: *See*—
Booth, Robert M., Jr., Elam, Holmstrom, Lallier, Lange, Lee, Muehldorf, Puri, Rosenbluth, and Savkar. T944,-007.

Roberts, Durward T., Jr., J. A. Beckman, L. E. Calihan, and A. F. Halasa, to The Firestone Tire & Rubber Co. Polymerization process wherein polymers are produced from saturated aliphatic hydrocarbons employing a combination of a strong Lewis acid and a strong Bronsted acid. T944,010, 3–2–76, Cl. 260—676.

Roberts, Richard J., and M. Crabtree. Method and apparatus for measuring the distance to discontinuities in a signal transmitting medium. T944,003, 3–2–76, Cl. 343—14.

Rosenbluth, William: *See*—
Booth, Robert M., Jr., Elam, Holmstrom, Lallier, Lange, Lee, Muehldorf, Puri, Rosenbluth, and Savkar. T944,-007.

Satya Akella V. S.: *See*—
Altman, Carl, Chapman, and Satya. T944,004.

Savkar, Anil D.: *See*—
Booth, Robert M., Jr., Elam, Holmstrom, Lallier, Lange, Lee, Muehldorf, Puri, Rosenbluth, and Savkar. T944,-007.

Schirtzinger, Joseph F., to Sea-Log Corp. Single point mooring system for use in arctic waters. T944,008, 3–2–76, Cl. 9—8.

Sea-Log Corp.: *See*—
Schirtzinger, Joseph F. T944,008.

Wininger, Brice S.: *See*—
Brewer, Richard J., Chambers, and Wininger. T944,005.

Wolff, Peter K., Sr.: *See*—
Hanan, Maurice, and Wolff. T944,001.

Woodrum, Luther J., to International Business Machines Corp. End-of-path insertion system. T944,002, 3–2–76, Cl. 444—1.

INDEX OF APPLICANTS AND ASSIGNEES

OF

REISSUE APPLICATIONS PUBLISHED ON THE 2ND DAY OF MARCH, 1976

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Bell Telephone Laboratories, Incorporated: *See*—
Watson, Hugh Alexander, B 587,118.

Evans, Roger L., to Minnesota Mining and Manufacturing Company. Biodegradable radioactive particles. B 451,438, Cl. 424-1.000.

Holubar Mountaineering, Ltd.: *See*—
Kack, James W.; and Mowbray, Terry W., B 551,952.

Kack, James W.; and Mowbray, Terry W., to Holubar Mountaineering, Ltd. Method of manufacture of down insulated goods. B 551,952, Cl. 28-77.000.

Minnesota Mining and Manufacturing Company: *See*—
Evans, Roger L., B 451,438.

Mowbray, Terry W.: *See*—
Kack, James W.; and Mowbray, Terry W., B 551,952.

Watson, Hugh Alexander, to Bell Telephone Laboratories, Incorporated. Compact flatbed page scanner. B 587,118, Cl. 178-7.100.

CLASSIFICATION OF PUBLISHED REISSUE PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM

DATE PUBLISHED MARCH 2, 1976

NOTE.—First number, class; second number, subclass; third number, document number

		CAT.	PUB. DATE
Class 28			
77	B551,952	M	Mar. 2, 1976
Class 178			
7.1	B587,118	E	Mar. 2, 1976
Class 424			
1	B451,438	C	Mar. 2, 1976

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 2ND DAY OF MARCH, 1976

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Davis, Dalton M. Vehicle wheel manufacturing apparatus. Re. 28,726, Cl. 29-208.00D.

O'Connor, David Evans; and Wyness, Glen Reid, to Procter & Gamble Company, The. Process for synthesizing specific complete mixed polyol esters. Re. 28,728, Cl 260-410.700.

Procter & Gamble Company, The: *See*—
O'Connor, David Evans; and Wyness, Glen Reid, Re. 28,728.
Yetter, Jerry Joseph, Re. 28,729.

Reinke, Richard F. Circular irrigation system with worm gear drive. Re. 28,727, Cl. 239-177.000.

Wyness, Glen Reid: *See*—
O'Connor, David Evans; and Wyness, Glen Reid, Re. 28,728.

Yetter, Jerry Joseph, to Procter & Gamble Company, The. Process for synthesizing specific complete mixed polyol esters. Re. 28,729, Cl. 260-410.700.

LIST OF PLANT PATENTEES

Garrett, Curran L. St. Augustine grass. 3,834, 3-2-76, Cl. 88.

LeCoufle, Maurice, and M. Vacherot, to Les Petits-Fils et Fils de Vacherot & LeCoufle. Orchid plant (realite). 3,835, 3-2-76, Cl. 68.

Les Petits-Fils et Fils de Vacherot & LeCoufle: *See*—
LeCoufle, Maurice, and Vacherot, 3,835.

McColley, Robert H. Philodendron plant. 3,831, 3-2-76, Cl. 88.

Pan-American Plant Co.: *See*—
Shoesmith, Leonard H. 3,832-3.

Shoesmith, Leonard H., to Pan-American Plant Co. Chrysanthemum (minuteman). 3,832, 3-2-76, Cl. 79.

Shoesmith, Leonard H., to Pan-American Plant Co. Chrysanthemum plant (brandywine). 3,833, 3-2-76, Cl. 81.

Vacherot, Michel: *See*—
LeCoufle, Maurice, and Vacherot, 3,835.

LIST OF DESIGN PATENTEES

Abbott Laboratories: *See*—
D'Alo, Herbert F. 239,021-5.
Flinn, Robert D. 239,019.
Knox, Kenneth H. 239,018.
Knox, Kenneth H., and D'Alo. 239,026-7.
Manschot, James G., Knox, and Flinn, 239,020.

Acro-Fab Industries, Inc.: *See*—
Seakan, Raymond N. 239,003.

Anderson, Richard, to Varian Associates. Console for cost estimation data processor. 239,032, 3-2-76, Cl. D26—5.

Anderson, Bengt A. F. Waste paper press. 239,051, 3-2-76, Cl. D55—1.

Asaki, James T., to International Telephone & Telegraph Corp. Luminaire. 239,047, 3-2-76, Cl. D48—31.

Baxter Laboratories, Inc.: *See*—
Newman, Ferris E. 239,059.

Bell & Howell Co.: *See*—
Hertel, Heinz E., and Vasilatos. 239,014.

Benavides, Manuel M. Table. 238,991, 3-2-76, Cl. D6—113.

Bolen, Bruce J., and E. Klein, to Norlin Music, Inc. Electric guitar or similar article. 239,052, 3-2-76, Cl. D56—1.

Chace, W. M., Co.: *See*—
Chope, Edward R. 239,004.

Chope, Edward R., to W. M. Chace Co. Reel for thin metallic or similar materials. 239,004, 3-2-76, Cl. D8—220.

Christie, Cornelius W., Jr., to General Electric Co. Clock radio. 239,053, 3-2-76, Cl. D56—4.

Citic Industries, Inc.: *See*—
Senter, Jonas. 238,983-4.

Clivio, Franco: *See*—
Raffle, Dieter, and Clivio. 238,998.

Cloud, James R., Sr. Zipper operator. 238,985, 3-2-76, Cl. D2—415.

Collister, Kenneth D.: *See*—
Freake, Ronald, Mehta, Kuo, Collister, and Johnson. 239,042.

Construction Products, Inc.: *See*—
Weber, Manfred, Rothe, Kopke, and Weber. 239,028.

Conway, Ronald L., R. V. Jones, J. J. Natoli, and J. V. Stram, to International Business Machines Corp. Magnetic stripe card reader or the like. 239,029, 3-2-76, Cl. D26—5.

Corbin Gentry, Inc.: *See*—
Hanagan, Michael W. 238,987-8.

Crasnianski-France S.A.: *See*—
Crasnianski, Serge P. 239,050.

Crasnianski, Serge P., to Crasnianski-France S.A. Machine for automatically duplicating keys. 239,050, 3-2-76, Cl. D55—1.

Curtis, William R., and D. C. Trimble, to Hercules Inc. Furniture subframe. 238,995, 3-2-76, Cl. D6—195.

D'Alo, Herbert F.: *See*—
Knox, Kenneth H., and D'Alo. 239,026-7.

D'Alo, Herbert F., to Abbott Laboratories. Valve actuator for a urinary drainage bag or the like. 239,021, 3-2-76, Cl. D23—19.

D'Alo, Herbert F., to Abbott Laboratories. Valve actuator for a urinary drainage bag or the like. 239,022, 3–2–76, Cl. D23—19.
D'Alo, Herbert F., to Abbott Laboratories. Valve actuator for a urinary drainage bag or the like. 239,023, 3–2–76, Cl. D23—19.
D'Alo, Herbert F., to Abbott Laboratories. Valve actuator for a urinary drainage bag or the like. 239,024, 3–2–76, Cl. D23—19.
D'Alo, Herbert F., to Abbott Laboratories. Valve actuator for a urinary drainage bag or the like. 239,025, 3–2–76, Cl. D23—19.
Duo-Fast Corp.: *See*—
Yohana, Andrew I. 239,001.
Eldon Industries, Inc.: *See*—
Spencer, Richard O. 239,013.
Ethicon, Inc.: *See*—
Fuson, Robert L., and Larson. 239,017.
Evans, F. Fish feeder. 239,040, 3–2–76, Cl. D30—13.
Fish, Darrell D., to Universal Synergetics, Inc. Toothpick dispenser. 239,049, 3–2–76, Cl. D52—2.
Flinn, Robert D.: *See*—
Manschot, James G., Knox and Flinn. 239,020.
Flinn, Robert D., to Abbott Laboratories. Valve actuator for a urinary drainage bag or the like. 239,019, 3–2–76, Cl. D23—19.
Fox, Philip J.: *See*—
Supino, Peter F, and Fox. 239,010.
Freake, Ronald, D. Mehta, M. H. Kuo, K. D. Collister, and L. C. Johnson, to Miles Laboratories, Inc. Loop needle. 239,042, 3–2–76, Cl. D32—1.
Fuson, Robert L., and W. S. Larson, to Ethicon, Inc. Six-way stopcock. 239,017, 3–2–76, Cl. D23—38.
Galvez, Rafael A. Mobile chair or similar article. 238,990, 3–2–76, Cl. D6—78.
Gardena Kress + Kastner GmbH: *See*—
Raffle, Dieter, and Clivio. 238,998.
Gaylord, John F., Jr., to Medical Specialties, Inc. Protective pad for bedridden patients. 239,058, 3–2–76, Cl. D83—1.
Genaro, Donald M., A. A. Hagstrom, and C. R. Winston, to Teletype Corp. Record communications terminal. 239,030, 3–2–76, Cl. D26—5.
General Electric Co.: *See*—
Christie, Cornelius W., Jr. 239,053.
Grosfillex, Raymond, to Grosfillex S.A.R.L. Armchair (madras). 238,989, 3–2–76, Cl. D6—70.
Grosfillex S.A.R.L.: *See*—
Grosfillex, Raymond. 238,989.
Hagstrom, Arthur A.: *See*—
Genaro, Donald M., Hagstrom, and Winston. 239 030.
Hamasaka, Paul A. Handlebar extender. 239,011, 3–2–76, Cl. D12—178.
Hanagan, Michael W., to Corbin Gentry, Inc. Motorcycle seat. 238,987, 3–2–76, Cl. D6—48.1.
Hanagan, Michael W., to Corbin Gentry, Inc. Motorcycle seat. 238,988, 3–2–76, Cl. D6—48.1.
Harris, Robert K., to Ringley & Crockett, Inc. Artificial fishing lure. 239,016, 3–2–76, Cl. D22—28.
Hercules Inc.: *See*—
Curtis, William R., and Trimble. 238,995.
Hertel, Heinz E., and A. J. Vasilatos, to Bell & Howell Co. Film cartridge. 239,014, 3–2–76, Cl. D61—1.
Hewett, Charley L., to Kem-O-Kleen, Inc. Pressurized spray cleaning unit. 239,048, 3–2–76, Cl. D49—11.
Hildebrandt, William J., and R. H. Russell, to The Stanley Works. Mitre box. 239,002, 3–2–76, Cl. D8—71.
Hirst, B., & Sons Ltd.: *See*—
Hirst, Brian F. 239,038–9.
Hirst, Brian F., to B. Hirst & Sons Ltd. Tennis post cap. 239,038, 3–2–76, Cl. D28—1.
Hirst, Brian F., to B. Hirst & Sons Ltd. Tennis post cap. 239 039 3–2–76, Cl. D28—1.
Holliday, Robert G., to Xerox Corp. Hand-held viewer for microforms. 239,055, 3–2–76, Cl. D61—1.
Holliday, Robert G., to Xerox Corp. Hand-held viewer for microforms. 239,056, 3–2–76, Cl. D61—1.
Industrial Science & Technology, Agency of: *See*—
Izuhara, Eiichi, and Ohira. 239,009.
International Business Machines Corp.: *See*—
Conway, Ronald L, Jones, Natoli, and Stram. 239,029.
International Playtex, Inc.: *See*—
Lo Cascio, Jamk J., and Stern. 238,982.
International Telephone & Telegraph Corp.: *See*—
Asaki, James T. 239,047.
Izuhara, Eiichi, and T. Ohira, to Agency of Industrial Science & Technology. Bicycle or the like. 239,009, 3–2–76, Cl. D12—111.
Jackson, Lendon E. Mobile target for a game involving skill. 239,044, 3–2–76, Cl. D34—5.
Johnson, Leighton C.: *See*—
Freake, Ronald, Mehta, Kuo, Collister, and Johnson. 239,042.
Jones, Robert V.: *See*—
Conway, Ronald L, Jones, Natoli, and Stram. 239,029.
Kato, Yoshikazu. Electrical test meter. 239,007, 3–2–76, Cl. D10—75.
Kelley, Stephen H. Electronic test device. 239,006, 3–2–76, Cl. D10—75.
Kem-O-Kleen, Inc.: *See*—
Hewett, Charley L. 239,048.
Klein, Edward: *See*—
Boien, Bruce J., and Klein. 239,052.
Knox, Kenneth H.: *See*—
Manschot, James G., Knox, and Flinn. 239,020.
Knox, Kenneth H., to Abbott Laboratories. Valve actuator for a urinary drainage bag or the like. 239,018, 3–2–76, Cl. D23—19.
Knox, Kenneth H., and H. F. D'Alo, to Abbott Laboratories. Valve actuator for a urinary drainage bag or the like. 239,026, 3–2–76, Cl. D23—19.
Knox, Kenneth H., and H. F. D'Alo, to Abbott Laboratories. Valve actuator for a urinary drainage bag or the like. 239,027, 3–2–76, Cl. D23—19.
Koenig, Robert B., to Recognition Equipment, Inc. Hand held optical character recognition scanning unit. 239,005, 3–2–76, Cl. D10—46.
Kopke, Gerald: *See*—
Weber, Manfred, Rothe, Kopke, and Weber. 239,028.
Kuo, Mau H.: *See*—
Freake, Ronald, Mehta, Kuo, Collister, and Johnson. 239,042.
L.N.P. & Associates: *See*—
Pagano, Raymond V. 239,054.
Lander, Pamela A. Doll. 239,043, 3–2–76, Cl. D34—4.
Lapointe, Gabriel M., to Parker Mfg. Co. Rivet gun. 239,000, 2–2–76, Cl. D8—51.
Larson, Wesley S.: *See*—
Fuson, Robert L., and Larson. 239,017.
Lo Cascio, Jamk J., and H. Stern, to International Playtex, Inc. Corselette. 238,982, 3–2–76, Cl. D2—3.
Madlem, John R. Conduit adapter. 239,031, 3–2–76, Cl. D26—5.
Manschot, James G., K. H. Knox, and R. D. Flinn, to Abbott Laboratories. Valve actuator for a urinary drainage bag or the like. 239–020, 3–2–76, Cl. D23—19.
McIlvain, Howard H.: *See*—
Rood, Christopher T., and McIlvain. 239,045.
Medical Specialties, Inc.: *See*—
Gaylord, John F., Jr. 239,058.
Mehta, Devendra: *See*—
Freake, Ronald, Mehta, Kuo, Collister, and Johnson. 239,042.
Miles Laboratories, Inc.: *See*—
Freake, Ronald, Mehta, Kuo, Collister, and Johnson. 239,042.
Monarch Marking Systems, Inc.: *See*—
Utzinger, William F. 239,057.
Natoli, John J.: *See*—
Conway, Ronald L, Jones, Natoli, and Stram. 239,029.
Newman, Ferris E., to Baxter Laboratories, Inc. Medical semi-permeable membrane support. 239,059, 3–2–76, Cl. D85—1.
Norlin Music, Inc.: *See*—
Bolen, Bruce J., and Klein. 239,052.
Numbers, Jody L. Wrench for camera lens, filters and thread adaptors. 238,999, 3–2–76, Cl. D8—17.
Ohira, Tomohiro: *See*—
Izuhara, Eiichi, and Ohira. 239,009.
Owens, Marion D. Toy lounge seat or similar article. 238,986, 3–2–76, Cl. D6—6.
Pagano, Raymond V., to L.N.P. & Associates. Closed circuit television camera exterior housing. 239,054, 3–2–76, Cl. D61—1.
Parker Mfg. Co.: *See*—
Lapointe, Gabriel M. 239,000.
Pintarelli, Ralph. Ear wire. 239,046, 3–2–76, Cl. D45—9.
Raffle, Dieter, and F. Clivio, to Gardena Kress + Kastner GmbH. Handle for a grass shear. 238,998, 3–2–76, Cl. D8—8.
Rasmussen, Howard J., to Stewart-Warner Corp. Reset odometer and speedometer. 239,008, 3–2–76, Cl. D10—98.
Recognition Equipment, Inc.: *See*—
Koenig, Robert B. 239,005.
Rees, Arnold E., to Wilkinson Sword Ltd. Safety razor. 239,060, 3–2–76, Cl. D95—3.
Ringley & Crockett, Inc.: *See*—
Harris, Robert K. 239,016.
Rood, Christopher T., and H. H. McIlvain, to Christopher T. Rood. Combined racket cover and press. 239,045, 3–2–76, Cl. D34—5.
Road Electronics, Inc.: *See*—
Ross, Charles A. 239,012.
Ross, Charles A. 239,035–6.
Ross, Charles A., to Road Electronics, Inc. Combined loudspeaker enclosure and amplifier housing. 239,012, 3–2–76, Cl. D26—14.
Ross, Charles A., to Road Electronics, Inc. Loudspeaker enclosure. 239,035, 3–2–76, Cl. D26—14.
Ross, Charles A., to Road Electronics, Inc. Loudspeaker enclosure. 239,036, 3–2–76, Cl. D26—14.
Rothe, Dennis W.: *See*—
Weber, Manfred, Rothe, Kopke, and Weber. 239,028.
Rubinstein, Morton K. Portable security container. 239,041, 3–2–76, Cl. D31—22.
Russell, Richard H.: *See*—
Hildebrandt, William J., and Russell. 239,002.
Schultz, Wilmer R. End cap for a stadium seat. 238,993, 3–2–76, Cl. D6—191.
Schultz, Wilmer R. Combined and slanted arm support for a stadium seat. 238,994, 3–2–76, Cl. D6—194.
Schultz, Wilmer R. Back for a stadium seat. 238,996, 3–2–76, Cl. D6—197.
Seakan, Raymond N., to Acro-Fab Industries, Inc. Bicycle lock. 239,003, 3–2–76, Cl. D8—114.
Senter, Jonas, to Citic Industries, Inc. Sport shoe. 238,983, 3–2–76, Cl. D2—310.
Senter, Jonas, to Citic Industries, Inc. Sport shoe. 238,984, 3–2–76, Cl. D2—310.
Sneidman, Ronald. Spoon or similar article of flatware. 238, 997, 3–2–76, Cl. D7—137.
Spencer, Richard O., to Eldon Industries, Inc. Soldering iron holder. 239,013, 3–2–76, Cl. D8—71.
Stanley Works, The: *See*—
Hildebrandt, William J., and Russell. 239,002.
Stern, Harold: *See*—
Lo Cascio, Jamk J., and Stern. 238,982.
Stewart-Warner Corp.: *See*—
Rasmussen, Howard J. 239,008.
Stilgenbauer, Ned T. Telephone handset hanger. 239,034, 3–2–76, Cl. D26—14.

Stout, Alvin L., to Ellis M. Wilson. Fishing stand. 239,015. 3–2–76, Cl. D22—13.
Stram, John V.: *See*—
Conway, Ronald I., Jones, Natoli, and Stram. 239,029.
Supino, Peter F., and P. J. Fox. Luggage rack. 239,010. 3–2–76, Cl. D12—158.
Teletype Corp.: *See*—
Genaro, Donald M., Hagstrom, and Winston. 239,030.
Tilman, Ted N. Single pole-double throw switch structure. 239,033. 3–2–76, Cl. D26—13.
Trimble, David C.: *See*—
Curtis, William R., and Trimble. 238,995.
Universal Synergetics, Inc.: *See*—
Fish, Darrell D. 239,049.
Utzinger, William F., to Monarch Marking Systems, Inc. Ink cartridge. 239,057. 3–2–76, Cl. D64—10.
Varian Associates: *See*—
Anderson, Richard. 239,032.
Vasilatos, Anastasios J.: *See*—
Hertel, Heinz E., and Vasilatos. 239,014.
Weber, Manfred J., D. W. Rothe, G. Kopke, and P. W. Weber, to Construction Products, Inc. Free-standing indoor stove. 239,028. 3–2–76, Cl. D23—97.
Weber, Paul W.: *See*—
Weber, Manfred, Rothe, Kopke, and Weber. 239,028.
Wilkinson Sword Ltd.: *See*—
Rees, Arnold E. 239,060.
Wilson, Ellis M.: *See*—
Stout, Alvin L. 239,015.
Winig, Stephen U. Combined work bench and desk or similar article. 238,992. 3–2–76, Cl. D6—161.
Winston, Charles R.: *See*—
Genaro, Donald M., Hagstrom, and Winston. 239,030.
Xerox Corp.: *See*—
Holliday, Robert G. 239,055–6.
Yanai, Taro. Combined ball point pen and lighter. 239,037. 3–2–76, Cl. D27—38.
Yohana, Andrew I., to Duo-Fast Corp. Magazine for fastener driving tool. 239,001. 3–2–76, Cl. D8—70.

CLASSIFICATION OF PATENTS

ISSUED MARCH 2, 1976

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2
311 3,940,801

CLASS 3
1.1 3,940,803
1.4 3,940,802
30 3,940,804

CLASS 4
67A 3,940,805
146 3,940,806
172 3,940,807
172.12 3,940,809

CLASS 5
86 3,940,808
241 3,940,810
360 3,940,812
361R 3,940,811

CLASS 8
2 3,941,559
41C 3,941,560
92 3,941,561

CLASS 9
2C 3,940,813
8R 3,940,814
309 3,940,815

CLASS 12
7 3,940,816

CLASS 15
1.7 3,940,817
3.53 3,940,818
21C 3,940,819
36 3,940,820
97B 3,940,821
250.22 3,940,822
250.42 3,940,823
257.06 3,940,824
306B 3,940,825
320 3,940,826
328 3,940,827

CLASS 16
163 3,940,828
3,940,829

CLASS 17
24 3,940,830

CLASS 19
156.3 3,940,831

CLASS 21
2.7R 3,941,562

CLASS 23
230B 3,941,564
3,941,565
230R 3,941,563
3,941,566
253PC 3,941,567
260 3,941,568

CLASS 24
20R 3,940,832

CLASS 26
18.6 3,940,833

CLASS 29
105R 3,940,835
149.5C 3,940,836
157.5 3,940,837
183.5 3,941,569
187.5 3,941,570
203DT 3,940,838
208F 3,940,839
208R Re.28,726
235 3,940,840
243.56 3,940,841
437 3,940,843
450 3,940,844
453 3,940,845
577 3,940,846
590 3,940,847
599 3,940,848
628 3,940,849
630C 3,940,850

CLASS 30
34.2 3,940,851
241 3,940,852
278 3,940,842
346.58 3,940,853

CLASS 33
174L 3,940,854
178R 3,940,855
3,940,856
189 3,940,857
228 3,940,858
270 3,940,859

CLASS 34
46 3,940,860
75 3,940,861

CLASS 35
11 3,940,862
22R 3,940,863

CLASS 40
134 3,940,865
136 3,940,864
142R 3,940,866

CLASS 43
6.5 3,940,867
17.6 3,940,868
42.53 3,940,869
43.13 3,940,871
3,940,872
44.2 3,940,870
57.5R 3,940,873
114 3,940,874
124 3,940,875
131 3,940,876

CLASS 46
17 3,940,877
47 3,940,878
150 3,940,879
161 3,940,880
234 3,940,881
243AV 3,940,882

CLASS 47
1.1 3,940,883
32 3,940,884
58 3,940,885

CLASS 49
137 3,940,887
319 3,940,886

CLASS 51
229 3,940,888
288 3,940,889

CLASS 52
79 3,940,890
82 3,940,891
86 3,940,892
90 3,940,893
129 3,940,894
167 3,940,895
307 3,940,896
395 3,940,897
400 3,940,898
481 3,940,899
656 3,940,900
717 3,940,901
745 3,940,902
3,940,903

CLASS 53
3 3,940,904
14 3,940,905
29 3,940,906
48 3,940,907
59R 3,940,908
167 3,940,909

CLASS 55
16 3,940,912
90 3,941,572
316 3,941,573
500 3,941,571

CLASS 56
14.4 3,940,910
14.6 3,940,911
98 3,940,913

CLASS 57
77.4 3,940,914
122 3,940,915
140R 3,940,916
152 3,940,917

CLASS 58
33 3,940,918
38R 3,940,919
42.5 3,940,920
85.5 3,940,921
90R 3,940,922

CLASS 60
39.06 3,940,923
39.08 3,940,924
39.45 3,940,925
226R 3,940,926
282 3,940,927
289 3,940,928
330 3,940,929
375 3,940,930
403 3,940,931
517 3,940,932
522 3,940,933
525 3,940,934
528 3,940,935
531 3,940,936
533 3,940,937
588 3,940,938
657 3,940,939

CLASS 61
1R 3,940,940
45B 3,940,941
72.3 3,940,942

CLASS 62
64 3,940,943
322 3,940,944

CLASS 64
2R 3,940,945
8 3,940,946
14 3,940,947
17R 3,940,948
25 3,940,949

CLASS 65
27 3,941,574
59A 3,941,575
135 3,941,576
136 3,941,577

CLASS 66
50R 3,940,950
3,940,951
154A 3,940,953
157 3,940,954

CLASS 68
20 3,940,955

CLASS 70
93 3,940,956
104 3,940,957
186 3,940,958
259 3,940,959

CLASS 71
28 3,941,578
94 3,941,579
107 3,941,580
118 3,941,581

CLASS 72
19 3,940,960
40 3,940,961
50 3,940,962
78 3,940,963
177 3,940,964
180 3,940,965
196 3,940,966
201 3,940,967
349 3,940,968
354 3,940,969
416 3,940,970

CLASS 73
3 3,940,971
23.1 3,940,972
67.8R 3,940,952
88R 3,940,973
88.5R 3,940,974
103 3,940,975
104 3,940,976
116 3,940,977
117 3,940,978
136A 3,940,979
152 3,940,980
167 3,940,981
170A 3,940,982
181 3,940,983
189 3,940,984
194VS 3,940,986
194A 3,940,985
346 3,940,987
349 3,940,988
379 3,940,989
387 3,940,990
393 3,940,991
398R 3,940,992
421B 3,940,993
422GC 3,940,994
3,940,995
432R 3,940,996
3,940,997
3,940,998
516LM 3,940,999

CLASS 74
3.5 3,941,000
5.2 3,941,001
16 3,941,002
44 3,941,003
206 3,941,004
233 3,941,005
242.1R 3,941,006
340 3,941,007
473R 3,941,008
3,941,009
545 3,941,010
551.2 3,941,011
661 3,941,012
740 3,941,013
826 3,941,014
856 3,941,015
867 3,941,016

CLASS 75
.5R 3,941,584
4 3,941,582
3,941,583
24 3,941,585
66 3,941,586
72 3,941,587
94 3,941,588
125 3,941,589
171 3,941,590

CLASS 81
57.39 3,941,017

CLASS 83
5 3,941,018
71 3,941,019
468 3,941,020
604 3,941,021
796 3,941,022

CLASS 84
1.01 3,941,023
3,941,024
1.25 3,941,025
382 3,941,026

CLASS 85
1R 3,941,027
73 3,941,028

CLASS 89
14E 3,941,029

CLASS 91
4R 3,941,030
6 3,941,031
6.5 3,941,032
446 3,941,033

CLASS 92
49 3,941,035

CLASS 93
1C 3,941,036
51R 3,941,037
58.4 3,941,038

CLASS 96
1.4 3,941,592
1.5 3,941,591
3,941,593
1.8 3,941,594
27E 3,941,595
29R 3,941,597
48R 3,941,598
66.3 3,941,599
80 3,941,600
100 3,941,601
101 3,941,602

CLASS 98
2.11 3,941,034
115LH 3,941,040
115K 3,941,039
115R 3,941,041

CLASS 99
289R 3,941,042
339 3,941,043
391 3,941,044
556 3,941,045

CLASS 100
45 3,941,046
100 3,941,047
215 3,941,048
274 3,941,049

CLASS 101
11 3,941,050
93.04 3,941,051
93.48 3,941,052
124 3,941,053
409 3,941,054
415.1 3,941,055

CLASS 102
22 3,941,056
52 3,941,057
70.2GA 3,941,058
91 3,941,059

CLASS 104
247 3,941,060

CLASS 105
135 3,941,061
157R 3,941,062
203 3,941,063
368R 3,941,064

CLASS 106
39.5 3,941,604
47Q 3,941,605
243 3,941,606
281R 3,941,607
285 3,941,608
290 3,941,609
300 3,941,603
308M 3,941,610

CLASS 110
8F 3,941,065
18R 3,941,066
163 3,941,067

CLASS 112
162 3,941,068
262 3,941,069

CLASS 113
7A 3,941,070

CLASS 114
72 3,941,071
165 3,941,072
183R 3,941,073

CLASS 115
1A 3,941,074
2 3,941,075
12R 3,941,076

CLASS 116
70 3,941,077
118A 3,941,078
124B 3,941,079
130 3,941,080
142FP 3,941,081
171 3,941,082
173 3,941,083

CLASS 118
7 3,941,084
60 3,941,085
63 3,941,086
306 3,941,087
620 3,941,088

CLASS 119
1 3,941,089
3,941,090
18 3,941,091
19 3,941,092
20 3,941,093
80 3,941,094
103 3,941,095
159 3,941,096

CLASS 122
32 3,941,099

CLASS 123
8.09 3,941,097
8.13 3,941,098
32EA 3,941,100
46H 3,941,101
90.52 3,941,102
117R 3,941,103
119CB 3,941,104
119A 3,941,105
122AC 3,941,106
139AW 3,941,109
146.5A 3,941,107
148CC 3,941,110
148E 3,941,108
3,941,111
3,941,112
179R 3,941,113
195R 3,941,114
198E 3,941,115

CLASS 126
92B 3,941,116
215 3,941,117
362 3,941,118

CLASS 128
2M 3,941,119
4 3,941,120
6 3,941,121
24A 3,941,122
84B 3,941,123
142 3,941,124
155 3,941,125
214R 3,941,126
215 3,941,127
218NV 3,941,128
218A 3,941,130
218R 3,941,129
237 3,941,131
283 3,941,133
296 3,941,132
330 3,941,134
419PS 3,941,135
422 3,941,136
423R 3,941,137

CLASS 132
9 3,941,613

CLASS 133
2 3,941,138

CLASS 134
64R 3,941,611
176 3,941,139

CLASS 135
4R 3,941,140

CLASS 136
6LF 3,941,612
29 3,941,614
38 3,941,615
100M 3,941,616
170 3,941,617
173 3,941,618

CLASS 137
1 3,941,141
101 3,941,142
102 3,941,143
110 3,941,144
318 3,941,145
355.16 3,941,146
453 3,941,147
486 3,941,148
493.1 3,941,149
504 3,941,150
527.6 3,941,151
549 3,941,152
562 3,941,153
624.15 3,941,154
627.5 3,941,155

CLASS 138
90 3,941,156
115 3,941,157
147 3,941,159
178 3,941,160

CLASS 139
1E 3,941,161
122W 3,941,158
383R 3,941,162
384B 3,941,163

CLASS 140
58 3,941,164
147 3,941,165
149 3,941,166

CLASS 141
1R 3,941,167
46 3,941,168
61 3,941,169
183 3,941,170
309 3,941,171
392 3,941,172

CLASS 144
114R 3,941,173
208J 3,941,174

CLASS 148
11.5R 3,941,619
12.7 3,941,620
27 3,941,621
3,941,622
113 3,941,623
175 3,941,624
187 3,941,625

CLASS 149
36 3,941,626

CLASS 152
242 3,941,175
340 3,941,176
362R 3,941,177

CLASS 156
3 3,941,627
3,941,628
8 3,941,629
13 3,941,630
59 3,941,631
71 3,941,632
77 3,941,633
79 3,941,634
86 3,941,635
154 3,941,636
179 3,941,637
196 3,941,638
207 3,941,639
234 3,941,596
252 3,941,640
272 3,941,641
297 3,941,642
380 3,941,643
433 3,941,644
435 3,941,645
545 3,941,646
612 3,941,647
622 3,941,648

CLASS 157
13 3,941,178

CLASS 160
84R 3,941,179
229R 3,941,180

CLASS 162
19 3,941,649
237 3,941,650
301 3,941,651

CLASS 164
59 3,941,181
86 3,941,182
147 3,941,183
270 3,941,184

CLASS 165
4 3,941,185
47 3,941,186
157 3,941,187
162 3,941,188

CLASS 166
.5 3,941,189
187 3,941,190
288 3,941,191
304 3,941,192

CLASS 172
106 3,941,193
311 3,941,194
801 3,941,195

CLASS 174
23R 3,941,913
42 3,941,914
48 3,941,915
52FP 3,941,916
65SS 3,941,917
140C 3,941,918

CLASS 175
100 3,941,196
400 3,941,197

CLASS 176
19LD 3,941,652
36R 3,941,653
61 3,941,654

CLASS 178
5.6 3,941,919
5.8R 3,941,920
6 3,941,921
3,941,922
6.8 3,941,923
3,941,924
3,941,925
7.3D 3,941,926
7.6 3,941,927
7.8 3,941,928
67 3,941,929
69.5R 3,941,930

CLASS 179
1F 3,941,932
1G 3,941,931
1H 3,941,933
6R 3,941,934
15AT 3,941,935
3,941,936
3,941,947
18EB 3,941,937
3,941,938
18GE 3,941,952
18GF 3,941,940
18HB 3,941,939
84R 3,941,941
90K 3,941,942
99 3,941,943
3,941,944
100.3Z 3,941,945
111R 3,941,946
170R 3,941,948
175.2R 3,941,949
175.3R 3,941,950
179 3,941,951

CLASS 180
11 3,941,198
44R 3,941,199
79.2R 3,941,200
98 3,941,201
105E 3,941,202
3,941,203
111 3,941,204

CLASS 181
33HB 3,941,205
50 3,941,206
199 3,941,207

CLASS 182
3 3,941,208
186 3,941,209

CLASS 184
6.21 3,941,210
56A 3,941,211

CLASS 185
37 3,941,212

CLASS 187
9R 3,941,213
29R 3,941,214

CLASS 188
24 3,941,215
72.4 3,941,216
79.5GT 3,941,217
106F 3,941,218
170 3,941,219
196BA 3,941,220
218XL 3,941,221
250G 3,941,222

CLASS 192
4A 3,941,223
13A 3,941,224
104C 3,941,225

CLASS 194
1K 3,941,227
1R 3,941,226

CLASS 195
31F 3,941,655
36R 3,941,656
66R 3,941,657
103.5R 3,941,658
3,941,659
103.7 3,941,660
127 3,941,661
3,941,662

CLASS 197
18 3,941,228
53 3,941,229
90 3,941,230
151 3,941,231

CLASS 198
20R 3,941,232
3,941,233
21 3,941,234
27 3,941,235
29 3,941,236
41 3,941,237
184 3,941,238
3,941,239
218 3,941,240
230 3,941,241
254 3,941,242

CLASS 200
5R 3,941,953
44 3,941,954
3,941,955
61.2 3,941,956
82R 3,941,957
3,941,958
144B 3,941,959
3,941,960
3,941,961
148A 3,941,962
3,941,963
159A 3,941,964
296 3,941,965

CLASS 202
174 3,941,663

CLASS 203
1 3,941,664

CLASS 204
79 3,941,666
98 3,941,667
105R 3,941,668
3,941,669
158R 3,941,670
159.22 3,941,671
192 3,941,672
195S 3,941,673
212 3,941,674
256 3,941,675
266 3,941,676
272 3,941,677
299R 3,941,678

CLASS 206
359 3,941,243
360 3,941,244
438 3,941,245
455 3,941,246
511 3,941,247
531 3,941,248

CLASS 208
11LE 3,941,679
80 3,941,680
107 3,941,681
140 3,941,682
210 3,941,683

CLASS 209
3 3,941,684
9 3,941,685
74M 3,941,686
104 3,941,249
136 3,941,687
166 3,941,688
296 3,941,689
443 3,941,690

CLASS 210
2 3,941,691
11 3,941,692
34 3,941,693
40 3,941,694
49 3,941,695
62 3,941,696
117 3,941,699
167 3,941,697
208 3,941,698
223 3,941,700
386 3,941,701
391 3,941,702
499 3,941,703
528 3,941,704

CLASS 211
1.3 3,941,250
177 3,941,251

CLASS 212
69 3,941,252

CLASS 213
1.3 3,941,253
76 3,941,254

CLASS 214
1QG 3,941,255
1.4 3,941,256
16.1ED 3,941,257
17D 3,941,258
27 3,941,259
82 3,941,260
85 3,941,261
145R 3,941,262
152 3,941,263
390 3,941,264
505 3,941,265
518 3,941,266
730 3,941,267

CLASS 215
216 3,941,268
246 3,941,269
261 3,941,270

CLASS 219
10.49 3,941,966
10.55E 3,941,967
3,941,968
68 3,941,969
69R 3,941,970
85 3,941,971
97 3,941,972
121L 3,941,973
137R 3,941,974
509 3,941,975

CLASS 220
6 3,941,271
9LG 3,941,272
19 3,941,273
62 3,941,274
256 3,941,275
270 3,941,276
273 3,941,277

CLASS 221
73 3,941,278
86 3,941,279

CLASS 222
11R 3,942,135
52 3,941,280
56 3,941,281
76 3,941,282
187 3,941,283
202 3,941,284

CLASS 223
43 3,941,285

CLASS 224
48C 3,941,286

CLASS 226
57 3,941,287
74 3,941,288
76 3,941,289
83 3,941,290

CLASS 227
152 3,941,291

CLASS 228
4.5 3,941,294
35 3,941,292
44.1R 3,941,293
3,941,295
148 3,941,296
180A 3,941,298
219 3,941,299

CLASS 229
5.5 3,941,300
14BE 3,941,301
27 3,941,302
37E 3,941,303
39B 3,941,304
44R 3,941,305
53 3,941,306
69 3,941,307
3,941,308
73 3,941,309
180A 3,941,297

CLASS 235
54F 3,941,976
61.11E 3,941,979
61.11R 3,941,978
61.7B 3,941,977
92DP 3,941,982
92GC 3,941,980
92V 3,941,981
150.27 3,941,983
3,941,984
151.1 3,941,985
3,941,986
151.11 3,941,987
3,941,988
156 3,941,989
176 3,941,990
197 3,941,991

CLASS 236
49 3,941,310

CLASS 237
16 3,941,311

CLASS 239
15 3,941,312
177 Re.28,727
265.29 3,941,313
553.3 3,941,314

CLASS 240
1.3 3,941,992
1.4 3,941,993
8.1R 3,941,994
51.11R 3,941,995

CLASS 241
3 3,941,315
15 3,941,316
21 3,941,317
101.4 3,941,318
290 3,941,319

CLASS 242
18DD 3,941,320
18A 3,941,321
18R 3,941,322
3,941,323
54R 3,941,324
55.54 3,941,325
56R 3,941,326
68.3 3,941,327
68.4 3,941,328
80 3,941,329
107.4R 3,941,330
118 3,941,331
189 3,941,332
197 3,941,333

CLASS 244
3.1 3,941,345
42CA 3,941,334
42CC 3,941,335
53B 3,941,336
129S 3,941,337

CLASS 246
77 3,941,338

CLASS 248
15 3,941,339
40 3,941,340
55 3,941,341
88 3,941,342
223 3,941,343
351 3,941,344

CLASS 249
40 3,941,346
204 3,941,347

CLASS 250
201 3,941,996
207 3,941,997
3,941,998
213VT 3,941,999
222R 3,942,000
223B 3,942,001
231R 3,942,002
255 3,942,003
266 3,942,004
310 3,942,005
326 3,942,006
331 3,942,007
332 3,942,008
338 3,942,009
352 3,942,010
363S 3,942,011
385 3,942,012
391 3,942,013
392 3,942,014
406 3,942,015
475 3,942,016
492B 3,942,017
493 3,942,018
512 3,942,019
515 3,942,023
539 3,942,020
572 3,942,021
578 3,942,022

CLASS 251
58 3,941,348
100 3,941,349
127 3,941,350
161 3,941,351

CLASS 252
8.05 3,941,705
59 3,941,706
62 3,941,707
78 3,941,708
3,941,709
99 3,941,710
117 3,941,711
126 3,941,712
142 3,941,713
301.4P 3,941,715
301.4S 3,941,714
415 3,941,716
423 3,941,719
430 3,941,717
3,941,718
463 3,941,720
466J 3,941,721
524 3,941,722
527 3,941,723

CLASS 254
98 3,941,352
124 3,941,353
135R 3,941,354

CLASS 259
4AC 3,941,355
7 3,941,356
104 3,941,357

CLASS 260
2.1R 3,941,724
2.5EP 3,941,725
2.5N 3,941,726
8 3,941,727
17A 3,941,729
17R 3,941,728
3,941,730
3,941,731
17.2 3,941,767
23.7B 3,941,732
29.2EP 3,941,794
29.2M 3,941,733
29.4R 3,941,734
29.6NR 3,941,736
29.6WB 3,941,735
30.6R 3,941,737
31.2T 3,941,738
33.2R 3,941,739
33.6AQ 3,941,740
37NP 3,941,742
37SB 3,941,741
38 3,941,743
45.8NT 3,941,745
45.8N 3,941,744
3,941,746
45.95H 3,941,747
47R 3,941,748
65 3,941,749
73R 3,941,750
75P 3,941,752
75T 3,941,751
77.5AP 3,941,855
77.5MA 3,941,753
78L 3,941,754
78R 3,941,755
78.5R 3,941,756
80.78 3,941,757
92.8A 3,941,759
94.9C 3,941,760
94.9D 3,941,761
112.5LH 3,941,763
112.5R 3,941,762
123.5 3,941,764
151 3,941,765
155 3,941,766
184 3,941,768
209R 3,941,769
211.5R 3,941,770
233.5 3,941,771
239B 3,941,772
239.1 3,941,773
3,941,774
239.3R 3,941,776
239.3 3,941,775
240B 3,941,778
240H 3,941,777
243B 3,941,782
243C 3,941,779
3,941,781
243D 3,941,780
247.7V 3,941,783
248C 3,941,784
249.5 3,941,785
251A 3,941,787
251R 3,941,786
256.4F 3,941,788
268BC 3,941,789
268DK 3,941,790
281Q 3,941,791
286Q 3,941,792
287G 3,941,793
293.83 3,941,795
293.84 3,941,796
296H 3,941,797
307A 3,941,798
308R 3,941,799
3,941,800
309 3,941,801
3,941,802
3,941,803
309.7 3,941,804
315 3,941,805
326.11R 3,941,806
326.13R 3,941,807
326.26 3,941,808
327M 3,941,809
329.8 3,941,810
335 3,941,811
338 3,941,812
340.7 3,941,813
349 3,941,814
396R 3,941,815
404.5 3,941,816
3,941,817
410.7 Re.28,728
Re.28,729
429.9 3,941,818
449R 3,941,819
449.6 3,941,820
453P 3,941,822
453R 3,941,821
455A 3,941,824
455R 3,941,823
465E 3,941,825
465R 3,941,826
465.7 3,941,827
468K 3,941,828
471A 3,941,831
471C 3,941,829
471R 3,941,830
3,941,832
472 3,941,833
504R 3,941,834
519 3,941,835
557R 3,941,836
561N 3,941,837
566AE 3,941,839
566A 3,941,838
3,941,840
570.5R 3,941,842
576 3,941,843
577 3,941,844
586R 3,941,841
3,941,845
593R 3,941,846
601R 3,941,847
604HF 3,941,848
607AR 3,941,849
619A 3,941,850
635R 3,941,851
643R 3,941,852
645 3,941,853
669R 3,941,854
825 3,941,856
837PV 3,941,857
880R 3,941,758
885 3,941,858

897B 3,941,859
900 3,941,860

CLASS 261

19 3,941,861
122 3,941,862

CLASS 264

95 3,941,865
98 3,941,863
135 3,941,866
256 3,941,864

CLASS 266

23E 3,941,358
24 3,941,359
37 3,941,360

CLASS 269

15 3,941,361
32 3,941,362
100 3,941,363
156 3,941,364
325 3,941,365

CLASS 270

31 3,941,366
3,941,367

CLASS 271

5 3,941,368
64 3,941,369
3,941,370
3,941,371
95 3,941,372
124 3,941,373
183 3,941,374
251 3,941,375
275 3,941,376

CLASS 272

57B 3,941,377

CLASS 273

5R 3,941,378
44 3,941,379
72A 3,941,380
85R 3,941,381
95R 3,941,382
3,941,383
105R 3,941,384
131BB 3,941,385
131C 3,941,386
134B 3,941,387
134G 3,941,388
142HA 3,941,389
169 3,941,390

CLASS 274

9B 3,941,391
10R 3,941,392

CLASS 277

9.5 3,941,393
40 3,941,394
41 3,941,395
134 3,941,396

CLASS 280

11.35N 3,941,397
47.19 3,941,398
47.29 3,941,399
79.1 3,941,400
96.2B 3,941,401
124F 3,941,403
124R 3,941,402
150AB 3,941,404
203 3,941,405
400 3,941,406
415A 3,941,407
421 3,941,408

CLASS 285

137R 3,941,409
321 3,941,410

CLASS 290

38R 3,942,024
55 3,942,025
3,942,026

CLASS 292

26 3,941,411

CLASS 294

74 3,941,412
86A 3,941,413

CLASS 296

23G 3,941,414
27 3,941,415

CLASS 297

45 3,941,416
85 3,941,417
355 3,941,418
389 3,941,419

CLASS 298

26 3,941,420

CLASS 299

2 3,941,421
4 3,941,422
8 3,941,423

CLASS 300

21 3,941,424

CLASS 302

14 3,941,425
26 3,941,426

CLASS 303

21AF 3,941,427
21F 3,941,428
3,941,429
22R 3,941,430
24A 3,941,431
52 3,941,432

CLASS 307

10R 3,942,027
66 3,942,028
88ET 3,942,029
117 3,942,030
147 3,942,031
148 3,942,032
215 3,942,033
221D 3,942,034
3,942,035
229 3,942,036
232 3,942,037
235J 3,942,038
251 3,942,039
252G 3,942,040
252M 3,942,041
268 3,942,042
279 3,942,043
290 3,942,044
297 3,942,046
3,942,047

CLASS 308

2R 3,941,433
9 3,941,434
20 3,941,435
72 3,941,436
121 3,941,437
132 3,941,438
159 3,941,439

CLASS 310

8.1 3,942,048
9.1 3,942,049
13 3,942,050
15 3,942,051
26 3,942,052
52 3,942,053
155 3,942,045
179 3,942,054
216 3,942,055
241 3,942,056
260 3,942,057

CLASS 312

71 3,941,440
215 3,941,441

CLASS 313

44 3,942,058
60 3,942,059
188 3,942,060
3,942,061
220 3,942,062
315 3,942,063
407 3,942,064
500 3,942,065

CLASS 315

5.43 3,942,066
13C 3,942,067
39 3,942,068
99 3,942,069
101 3,942,070
169TV 3,942,071

CLASS 317

4 3,942,072
6 3,942,073
36TD 3,942,074
41 3,942,075
80 3,942,076
118 3,942,077
142R 3,942,078
262A 3,942,079
3,942,080

CLASS 318

7 3,942,081
51 3,942,082
138 3,942,083
3,942,084
341 3,942,085
447 3,942,086
587 3,942,087
591 3,942,088

CLASS 321

2 3,942,089
4 3,942,090
5 3,942,091
11 3,942,092
45C 3,942,094
45R 3,942,093
47 3,942,095

CLASS 322

28 3,942,096
3,942,097

CLASS 323

23 3,942,098
44R 3,942,099
3,942,106
106 3,942,100

CLASS 324

1 3,942,101
16R 3,942,102
28R 3,942,103
30R 3,941,665
3,942,104
34R 3,942,105
57Q 3,942,107
59 3,942,108
77K 3,942,109
142 3,942,110
158MG 3,942,111
166 3,942,112
170 3,942,113
177 3,942,114

CLASS 325

4 3,942,115
22 3,942,116
161 3,942,117
303 3,942,118
308 3,942,119
344 3,942,120
419 3,942,121
459 3,942,122

CLASS 328

1 3,942,123
63 3,942,124
141 3,942,125
167 3,942,126

CLASS 330

4.3 3,942,127
22 3,942,128
29 3,942,129
34 3,942,130

CLASS 331

45 3,942,131
94.5C 3,942,133
94.5H 3,942,132
113R 3,942,134

CLASS 332

21 3,942,136

CLASS 333

16 3,942,137
21R 3,942,138
30R 3,942,139
72 3,942,140
98R 3,942,141

CLASS 335

112 3,942,142
132 3,942,143
3,942,144
188 3,942,145
212 3,942,146
285 3,942,147

CLASS 338

128 3,942,148

CLASS 339

17C 3,941,443
17M 3,941,442
60M 3,941,444
64M 3,941,445
75M 3,941,446
91R 3,941,447
176MF 3,941,448
217S 3,941,449

CLASS 340

3R 3,942,149
5H 3,942,150
53 3,942,151
146.1D 3,942,152
146.3AE 3,942,169
146.3B 3,942,154
146.3F 3,942,153
172.5 3,942,155
3,942,156
3,942,157
3,942,158
173LM 3,942,159
173PL 3,942,161
173R 3,942,160
3,942,162
3,942,163
3,942,164
174TF 3,942,165
213.1 3,942,166
244C 3,942,167
310A 3,942,170
310R 3,942,168
347DA 3,942,171
347NT 3,942,172
3,942,173
3,942,174
365R 3,942,175
416 3,942,176

CLASS 343

5PD 3,942,178
16M 3,942,177
3,942,181
18E 3,942,179
725 3,942,180

CLASS 346

53 3,942,182

CLASS 350

3.5 3,941,450
16 3,941,451
82 3,941,452
96GN 3,941,474
150 3,941,453
160LC 3,941,454
3,941,455
161 3,941,456
220 3,941,457
294 3,941,458
3,941,459
319 3,941,460

CLASS 351

95 3,941,461

CLASS 352

12 3,941,462
38 3,941,463
72 3,941,464
130 3,941,465

CLASS 353

27R 3,941,466
34 3,941,467

CLASS 354

29 3,942,183
42 3,942,184

CLASS 355

3DD 3,941,469
3,941,470
3R 3,941,468
3,941,471
16 3,941,472
75 3,941,473
78 3,941,475

CLASS 356

3 3,941,476
28 3,941,477
30 3,941,478
102 3,941,479
106LR 3,941,481
106R 3,941,480
114 3,941,482
152 3,941,483
156 3,941,484
159 3,941,485
172 3,941,486
181 3,941,487

CLASS 357

17 3,942,185
22 3,942,186
71 3,942,187

CLASS 360

10 3,942,188
13 3,942,189
63 3,942,190

CLASS 401

17 3,941,488
59 3,941,489
110 3,941,490
243 3,941,491

CLASS 403

104 3,941,492
122 3,941,493
188 3,941,494
267 3,941,495

CLASS 408

130 3,941,496
155 3,941,497

CLASS 415

46 3,941,498
116 3,941,499
136 3,941,500
147 3,941,501

CLASS 416

83 3,941,502
141 3,941,503
197A 3,941,504
244A 3,941,506

CLASS 417

2 3,941,507
46 3,941,508
54 3,941,509
57 3,941,510
3,941,511
153 3,941,512
202 3,941,505
212 3,941,513
216 3,941,514
240 3,941,515
259 3,941,516
420 3,941,517
442 3,941,518
560 3,941,519

CLASS 418

9 3,941,520
3,941,521
61A 3,941,522
91 3,941,523
99 3,941,524
142 3,941,525
149 3,941,526
196 3,941,527

CLASS 423

53 3,941,867
210 3,941,868
239 3,941,869
258 3,941,870
306 3,941,896
326 3,941,871
331 3,941,872
365 3,941,873
489 3,941,874
571 3,941,875

CLASS 424

1 3,941,876
52 3,941,877
233 3,941,878
240 3,941,879
241 3,941,880
250 3,941,881
251 3,941,889
263 3,941,882
274 3,941,883
282 3,941,884
305 3,941,885
317 3,941,886
322 3,941,887
331 3,941,888

CLASS 425

4R 3,941,528
3,941,529
83 3,941,530
96 3,941,531
117 3,941,532
143 3,941,533
145 3,941,534
208 3,941,535
222 3,941,536
228 3,941,537
241 3,941,538
242B 3,941,539
245NS 3,941,540
292 3,941,541
326B 3,941,542
371 3,941,543
376 3,941,544
383 3,941,545
387R 3,941,546
403 3,940,834
407 3,941,547
450.1 3,941,548
451.2 3,941,549
463 3,941,550
3,941,551

CLASS 426

46 3,941,890
94 3,941,891
104 3,941,892
285 3,941,893
532 3,941,894
549 3,941,895

CLASS 427

11 3,941,897
18 3,941,898
34 3,941,899
86 3,941,900
108 3,941,901
172 3,941,902
190 3,941,903
207 3,941,904
240 3,941,905
360 3,941,906

CLASS 428

341 3,941,907
379 3,941,908
424 3,941,909
457 3,941,910
525 3,941,911
537 3,941,912

CLASS 431

2 3,941,552
80 3,941,553
89 3,941,554
93 3,941,555
202 3,941,556

CLASS 432

17 3,941,557
60 3,941,558

D 2—	3	238,982		197	238,996		98	239,008			239,025			239,036	D52—	2B	239,049
	310	238,984	D 7—	137	238,997	D12—	111	239,009			239,026	D27—	38	239,037	D55—	1A	239,050
	415	238,985	D 8—	8	238,998		158	239,010			239,027	D28—	1C	239,038		B	239,051
D 3—	310	238,983		17	238,999		178	239,011		38	239,017			239,039	D56—	A	239,052
D 6—	6	238,986		51	239,000	D22—	28	239,016		97	239,028	D30—	13	239,040		4B	239,053
	48.1	238,987		70	239,001		33	239,015	D26—	5B	239,031	D31—	22	239,041	D61—	1J	239,055
		238,988		71	239,002	D23—	19	239,018		C	239,029	D32—	1R	239,042			239,056
	70	238,989			239,013			239,019			239,030	D34—	4C	239,043		Q	239,054
	78	238,990		114	239,003			239,020			239,032		5AT	239,045		T	239,014
	113	238,991		220	239,004			239,021		13R	239,033		PP	239,044	D64—	10	239,057
	161	238,992	D10—	46	239,005			239,022		14A	239,034	D45—	9	239,046	D83—	1F	239,059
	191	238,993		75	239,006			239,023		G	239,012	D48—	11	239,048		J	239,058
	194	238,994			239,007			239,024			239,035		31	239,047	D95—	3A	239,060
	195	238,995															

CLASSIFICATION OF PLANTS

P. —	68	3,835	P. —	79	3,832	P. —	81	3,833	P. —	88	3,831	P. —	3,834		

DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

9—	8P	T944,008	106—	180	T944,005	343—	14	T944,003	357—	15	T944,004		T944,002	T944,007
75—	168B	T944,006	260—	676R	T944,010	346—	75	T944,009	444—	1	T944,001			

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama 1
Alaska 2
American Samoa 3
Arizona 4
Arkansas 5
California 6
Canal Zone 7
Colorado 8
Connecticut 9
Delaware 10
District of Columbia 11
Florida 12
Georgia 13
Guam 14
Hawaii 15
Idaho 16
Illinois 17
Indiana 18
Iowa 19
Kansas 20
Kentucky 21
Louisiana 22
Maine 23
Maryland 24
Massachusetts 25
Michigan 26
Minnesota 27
Mississippi 28
Missouri 29
Montana 30
Nebraska 31
Nevada 32
New Hampshire 33
New Jersey 34
New Mexico 35
New York 36
North Carolina 37
North Dakota 38
Ohio 39
Oklahoma 40
Oregon 41
Pennsylvania 42
Puerto Rico 43
Rhode Island 44
South Carolina 45
South Dakota 46
Tennessee 47
Texas 48
Utah 49
Vermont 50
Virginia 51
Virgin Islands 52
Washington 53
West Virginia 54
Wisconsin 55
Wyoming 56
U.S. Air Force 57
U.S. Army 58
U.S. Navy 59

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1 : 3,941,345
3,941,355
3,942,114
3 : 3,941,626
4 : 3,940,846
3,941,349
3,941,501
3,941,582
3,941,775
3,941,942
3,941,983
3,942,033
3,942,037
3,942,047
3,942,065
3,942,160
3,942,162
3,942,164
5 : 3,940,859
3,940,990
6 : Re.28,726
3,940,804
3,940,807
3,940,812
3,940,814
3,940,817
3,940,821
3,940,832
3,940,842
3,940,852
3,940,868
3,940,869
3,940,873
3,940,878
3,940,891
3,940,906
3,940,959
3,940,962
3,940,965
3,940,970
3,940,980
3,940,981
3,940,982
3,940,994
3,941,024
3,941,026
3,941,034
3,941,042
3,941,047
3,941,049
3,941,051
3,941,052
3,941,078
3,941,079
3,941,090
3,941,094
3,941,104
3,941,124
3,941,127
3,941,131
3,941,134
3,941,150
3,941,165
3,941,171
3,941,202
3,941,227
3,941,242
3,941,247
3,941,258
3,941,272
3,941,294
3,941,310
3,941,330
3,941,332
3,941,333
3,941,340
3,941,342
3,941,346
3,941,347
3,941,350
3,941,358
3,941,384
3,941,386
3,941,387
3,941,395
3,941,397
3,941,399
3,941,406
3,941,412
3,941,437
3,941,451
3,941,467
3,941,475
3,941,487
3,941,495
3,941,533
3,941,547
3,941,548
3,941,553
3,941,565
3,941,581
3,941,613
3,941,621
3,941,622
3,941,663
3,941,668
3,941,693
3,941,695
3,941,697
3,941,862
3,941,876
3,941,884
3,941,886
3,941,890
3,941,915
3,941,916
3,941,923
3,941,924
3,941,950
3,941,953
3,941,954
3,941,957
3,941,966
3,942,010
3,942,020
3,942,026
3,942,043
3,942,084
3,942,092
3,942,101
3,942,108
3,942,109
3,942,116
3,942,123
3,942,124
3,942,129
3,942,130
3,942,150
3,942,156
3,942,179
8 : 3,940,805
3,940,936
3,941,005
3,941,077
3,941,091
3,941,140
3,941,421
3,941,476
3,941,589
3,941,982
3,941,996
3,942,178
9 : 3,940,836
3,940,844
3,940,884
3,940,888
3,941,068
3,941,159
3,941,302
3,941,338
3,941,343
3,941,356
3,941,364
3,941,414
3,941,480
3,941,484
3,941,489
3,941,498
3,941,558
3,941,619
3,941,620
3,941,627
3,941,628
3,941,676
3,941,708
3,941,822
3,941,889
3,941,895
3,941,906
3,942,167
3,942,177
10 : 3,940,955
3,941,300
3,941,546
3,941,563
3,941,603
3,941,633
3,941,728
3,941,730
3,941,736
3,941,751
3,941,824
3,941,826
3,941,857
3,941,904
12 : 3,940,896
3,941,037
3,941,092
3,941,254
3,941,267
3,941,295
3,941,755
3,941,971
3,942,067
13 : 3,941,027
15 : 3,940,894
3,941,120
16 : 3,941,010
3,941,344
17 : 3,940,823
3,940,864
3,940,879
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Design Patents

4	238,999	9	238,987		239,019		239,035		239,030		239,045
6	239,010		238,988		239,021		239,036	36	238,983		239,047
	239,011		239,002		239,022	24	239,049		238,984		239,057
	239,013		239,028		239,023	25	239,000		238,997	42	238,992
	239,032	10	238,995		239,024		239,003		239,029		238,993
	239,033	12	238,990		239,025	26	239,004		239,031		238,994
	239,040	13	238,985		239,026		239,055		239,053		238,996
	239,041		239,054		239,027		239,056	37	239,016	44	239,046
	239,043	17	239,001		239,052	29	239,006		239,058	48	238,991
	239,044		239,008		239,059	34	238,982	38	239,005		239,015
8	238,986		239,014	18	239,042		239,017	39	239,034	55	239,020
	239,048		239,018	20	239,012						

Plant Patents

12	3,831	48	3,834				

Defensive Publications Applications

[Notice of Dec. 16, 1969, 869 O.G. 6877]

6	T944,008	36	T944,001		T944,004	39	T944,006		T944,010	47	T944,005
21	T944,009		T944,002		T944,007						

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U.S. DEPARTMENT OF COMMERCE
Elliot L. Richardson, Secretary

PATENT AND TRADEMARK OFFICE
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